THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE,
DATED THE 12TH AUGUST 1873,

INTO THE CIRCUMSTANCES ATTENDING THE ACCIDENT ON THE

LONDON AND NORTH-WESTERN RAILWAY

WHICH OCCURRED AT

W I G A N

On the 2nd August 1873.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
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[C.—934.] *Price* 1*s.* 3*d.* 1874.

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Accident on the London and North-Western Railway which occurred at Wigan on the 2nd August 1873.

SIR, *12th September* 1873.

IN compliance with the instructions contained in your minute of the 12th of August, I have now the honour to report, for the information of the Board of Trade, the result of the Public Inquiry into the circumstances which attended the accident that occurred on the morning of the 2nd ultimo at the Wigan station, on the London and North-Western Railway.

This Inquiry was held under the Railway Regulations Act of 1871, 34 & 35 Vict. c. 78. ss. 7 and 8, with the assistance, as legal assessor, of Mr. W. W. Ravenhill, barrister-at-law, in the Council Chamber, which the Mayor and Corporation of Wigan were good enough to place at our disposal. It extended over five weeks, from the 5th August to the 9th September inclusive, during which it became necessary to hold nine sittings, and to examine 104 witnesses, including 69 officers and servants of the Company. The evidence, as taken down by a shorthand writer, is appended.

Mr. Darlington, the Coroner for the Borough, and a member of the legal profession of many years experience, attended our inquiry from day to day, and addressed such questions as he thought desirable to the witnesses; and he adjourned his inquest until the termination of our inquiry. We then sat with him, in accordance with our instructions, at the inquest, and rendered all the assistance in our power. And we desire to record our sense of the courtesy and assistance which were thus afforded by Mr. Darlington, with the co-operation of his jury. The double inquiry which might, under less favourable circumstances, have caused a clashing of interests or opinions, thus became, on the present occasion, a source of mutual advantage.

In this case, the 8 p.m. passenger train from London for the North, consisting of two engines and tenders and twenty-five carriages and vans, was approaching the Wigan station at a speed of about forty miles an hour, when several vehicles at the end of it were suddenly thrown off the rails, at a pair of facing-points connecting the down main line with a loop line running round the back (or west) of the platform at the station. Up to the present time thirteen passengers have died from the injuries which they received, and thirty passengers have complained of injury. The conductor of the train was also much injured.

GENERAL DESCRIPTION.

The existing station arrangements at Wigan are the result of extensions and alterations which were carried out about six years ago. They were not subjected to inspection by the Board of Trade, and no notice of them was given, or was required at that time by law to be given, to the Board of Trade with a view to such inspection.

The relative positions of the passenger platform, the down main line, the loop line, and the sidings at the Wigan station will be plainly seen by a reference to the accompanying diagram, which the Company have been so good as to furnish. It will be observed that there is a signal-cabin 211 feet on the south of the passenger-platform, and on the east of the lines of rails. It is from this cabin that the signals and points at the south of the station are worked; and 116 feet on the south of it there are a pair of facing-points leading to a loop line, which runs round the back or west of the down-line station-platform, and rejoins the down line on the north of the platform. It was at these facing-points —marked A in the diagram—that the carriages near the end of the train first commenced to leave the main line; and it is to these points, and to the portions of the main line and loop line immediately to the north of them, as well as to the signal-cabin, that attention must especially be directed.

In this signal-cabin, which is called the junction-cabin, there are 32 levers, 18 of which are employed to work 23 pairs of points, while 12 are signal-levers, and two are levers employed to work gongs in neighbouring cabins. No. 7 lever works the facing-points A. When this lever is pushed back in its normal position the points are right for the down main line; and when it is brought over to the front of the locking-frame the points are right for the loop line. No. 9 lever works the slip-points B, B, which require to be pulled over when the loop line is used. Both of these levers —No. 7 and No. 9—are interlocked with the home-signal for the down main line. The locking-frame was constructed by Mr. Saxby in 1866, and the apparatus is somewhat worn. We found, on trying the locking, that the lever of the distant-signal was not interlocked with the lever of the facing-points No. 7; that when the home-signal was lowered for a train to pass through the Wigan station along the down main line, the lever of the facing-point was then locked so as to be right for the main line; but that when No. 7 lever was pulled gently over, so as to set the points right for the loop-line, No. 13 lever, which works the home-signal of the down main-line, could also be pulled over; the lock which ought to have secured it in forward gear having from wear and tear become ineffective. When, however, No. 7 lever was pulled smartly over, then No. 13 lever was locked in forward gear. No. 9 lever, working the slip points (B, B, in the diagram), was properly interlocked with No. 13 lever; so that when the home-signal had been lowered, by pulling over No. 13 lever, for a main line train, no vehicle could pass along the loop line without straining those points or their connections until after No. 13 lever was pushed back, and No. 9 lever pulled forward. There are also in this cabin telegraph instruments and bells for working the permissive train-telegraph system in both directions along the main line.

The points No. 7 worked well from the signal-cabin. They are secured by double connecting rods, with cotters at the ends of them. The east tongue has a flat place about an inch and a half long on the west of it at its point, and is to some extent worn in the neighbourhood of the point. The west tongue is not damaged at the point, but the upper table is considerably worn near the fish-plate at the heel of the tongue; and though the point of this tongue lies close against the standard rail, there is a space of an eighth to a quarter of an inch between them, at four or five feet from the point towards the heel of the tongue. On the south of these facing-points, and 5 ft. 9 in. from them, there are a pair of leading-points (C in the diagram). As those two pairs of points lie open, with their near tongues against the near standard rails, so as to be right for the down main line, there is practically a bulge in the off rail towards the inside of five-sixteenths of an

inch as a maximum, near the facing-points, tapering off towards the leading-points, in consequence of the rail being bent to receive the tongues of the points. The corresponding near tongues, when the points are set right for the down main line, are housed against the standard rails on the near side; the bulge which occurs on that rail when the points are otherwise open is thus disposed of; and the main line rail, with these points against them, form practically a straight line for the wheels to run over on that (near) side. On the off side, just to the south of the facing-point, there is a flat place on the inside of the off rail, showing plainly where that rail receives a severe blow from the flanges of the wheels of passing or shunting trains. On the north of the leading-point there is a smaller flat place, similarly produced. At 23 feet south of the facing-points (A) are another pair of leading-points (D); and thus a train approaching Wigan from the South has, after rounding a curve of 30 chains radius, and coming upon a straight portion of line about 60 yards long, to pass, first over leading-points D, C, next over the bulge caused by the bent rail above referred to, and then through the facing-points A.

The points of junction with the Lancashire and Yorkshire Railway, E, F, are, as will be seen, on the north of the signal-cabin, and need not be considered with reference to the cause of the present accident.

On the diagram are also depicted the positions in which the eight last vehicles of the train, or their remains, were found after the accident;—the shunter's cabin on the south of the passenger platform, which was destroyed in the course of the accident;—and the principal marks on the rails, chairs, and ballast, —as well as they could be laid down from the evidence of those who were earliest on the spot or were able to give the best indications, and from the material evidence which remained open to observation subsequently. But many lighter marks, probably on the rails and especially in the ballast, which might, if they had at once been observed and recorded, have been useful in tracing out the cause and the course of the accident, were no doubt obliterated on the morning or day after it occurred;—as repairs were effected, the débris was cleared away, and the traffic was resumed;—and as the ballast was trampled over by spectators as well by those who were at work between the facing-points and the passenger platform. The tongues of the points are 15 ft. long, and are two years old. They are of iron, while the rails are, as already stated, of steel. It would hardly be wise to lay much stress on the slight flattening of the point of the east tongue, or the slight straining of the west tongue, above referred to, as having necessarily any connection with the accident. The various witnesses by no means agree as to their existence or otherwise immediately after the accident, and they might well have been there before the accident occurred. The first undoubted indications on the permanent way of the origin and cause of the accident were the fracture of the heel-chairs on either side of the fish-plate of the near tongue, at 14 and 16 feet from the point A, and the marks on the chairs and keys outside the main line rail, at 29 and 32 feet from the point A; and there can be no doubt from these marks that the flange of a near wheel in the train must, from whatever cause, have got on the wrong side of the near main line rail at those points. Passing northward along the loop line, a check-rail at 80 feet (from A) had been indented, and a check-rail at 102 feet had been displaced; at 232 and 234 feet an off rail had been broken in two places, and the piece, a little more than two feet long, completely knocked out; at 226 and 254 feet off rails had been marked by blows from the west; and from 314 to 400 feet the permanent way on the off-side had been more or less torn up. Passing northward along the down main line, there were broken chairs at 158, 161, 172, 174 feet (from A); a check-rail at 255 feet was marked; and there was little else as far as the station-platform. A rail was distorted and broken in a siding leading between the slip-points B and the down main line, near the corner of the station platform. There were tracks in the ballast, as roughly shown in the diagram; and the wooden coverings of the point-connections were broken or disturbed, no doubt by the passage of wheels over them; but these indications are not sufficient to account in any way for the passage of the various vehicles to the positions they occupied, from the rails either of the loop line or of the down main line; and there must have been numerous other marks visible immediately after the accident which have not been recorded. The tracks between the loop line and the main line towards the shunter's cabin and the platform are described as having apparently been produced by vehicles dragged along on their sides.

Looking now to the positions of the carriages and their débris in the diagram, the course of the train after the accident appears to have been as follows:—The two engines and tenders and fifteen of the vehicles passed through the station without leaving the rails. The family carriage, No. 14, which was sixteenth in the train, and in which rode Lady Florence Leveson Gower and Miss Bragge, left the rails on the south of the station, struck against some obstruction,—no doubt the corner of the platform on the west of the main line, with one of its steps and an axle-box, which were broken, and was finally dragged on to the rails at a crossing at the north of the station. The break-van, No. 175, behind this saloon, in which rode the conductor, Alexander Harper, was also thrown off the rails on the south of the station; it struck, apparently, the shunter's cabin, which tore away its near side, on the south of the station platform; and it was thus thrown across from the south end of the platform towards the intermediate space between the two main lines. After passing through the station, with its left side smashed in, but the conductor still in it, it was dragged on the rails again at the same crossing as the saloon carriage in front of it. The eighteenth vehicle, a Caledonian composite-carriage, No. 123, which contained Sir John Anson's party, lay on its floor on the platform, with its wheels in the air, and part of its body and its roof near the south-east corner of the platform. The five next vehicles were thrown forward in great confusion, towards the south-west corner of the station buildings, or between them and the wall of the station roof on the west of the loop line, some sliding quietly to rest up the slope of the platform, others displacing the coping and destroying the western edge of the platform, and crushing into one another with fatal results to the passengers. Portions of the composite carriage No. 56, were forced through a wall on the west of the station and across the roof of a wooden forge, one of the passengers, Mrs. Roberts, falling from it into the foundry below. The guard's van, No. 8 (Caledonian), in which rode head-guard (May) of the train, and the last carriage of the train, No. 1196, came to a stand, on their wheels but off the rails, in the ballast of the loop-line; but the marks on them showed that they had previously been in contact with the platform.

The Wigan station is approached from the direction of Warrington, as will be seen by the plan and section in plate No. 2, on varying gradients, of which 1 in 132 is the steepest, until, in passing the loop-line facing-points (A), there is a rising gradient of 1 in 100; and the line rises, as will also be seen on the section, considerably on the north of Wigan. There is a curve, having a radius of 30 chains, on the south of the station, and then a straight portion, about 60 yards long, to the facing-points (A).

The permanent way is of a very substantial description. It is laid with steel rails of a double-headed section, weighing 84 lbs. to the lineal yard, fished at the joints with suspended wrought-iron plates and screw-bolts and nuts. The chairs are of cast-iron, weighing 50 lbs. each, and are secured to the sleepers by two wrought-iron spikes and two trenails in each sleeper. The sleepers are of Baltic timber, measuring nine feet long by 10″ × 5″ in section, and they are laid at inter-

vals of three feet apart from centre to centre. The ballast is of refuse coal and cinders.

The gauge between the rails at and near the facing-points on the Tuesday morning, three days after the accident, I found to be as follows :—At the fish-plate of the leading-points C (south of the facing-points), the gauge was one-eighth of an inch tight. Five feet northward, the gauge was correct. At the north of the leading-points C, the gauge was seven-eighths of an inch wide; one foot north of leading-points, slightly easy. Chair north of fish-plate 14 inches south of facing-points, gauge slightly tight. Four-and-half inches south of facing-points, gauge slightly easy. Immediately to south of facing-points, gauge barely five-eighths of an inch wide. Three feet six inches north of facing-points, gauge barely half an inch wide. Six feet north of facing-points, gauge one quarter of an inch wide. Eleven feet north of facing-points, gauge slightly tight. Fish-joint 15 feet north of facing-points, gauge one eighth of an inch tight. Six feet north of facing-points, gauge one quarter of an inch tight. Throat south of crossing-points, gauge one quarter of an inch tight.

The levels of the rails at and near the facing-points were as follows :—At the fish-joint 14 inches south of the facing-points, the east rail was one-eighth of an inch lower than the west rail. At the facing-points, the east rail was nearly one quarter of an inch lower than the west rail. At six feet six inches north of the facing-points, the east rail was half an inch lower than the west rail. At the fish-joint 15 feet north of the facing-points, about the same.

The following shows the composition of the train as it approached Wigan at 1.15 a.m. on the 2nd August :—

Order in train.		No. of vehicle.	Destination.
1	L. & N. W. guards van	100	Greenock.
2	W. C. Composite carriage	39	„
3	„ „	16	„
4	L. & N.W. „	999	„
5	„ „	943	„ (Mr. Hering).
6	„ family carriage	50	Wemyss Bay.
7	„ third-class	240	Perth.
8	„ family carriage	12	Alyth (attached at Warrington).
9	„ first-class	83	Perth.
10	„ composite	569	„
11	„ „	1204	„
12	„ „	1273	„ (Rev. C. W. Dod).
13	„ „	1054	„
14	„ first-class	185	„
15	„ family carriage	44	„ (Mr. Matheson.)
16	„ family carriage	14	Golspie (attached at Stafford, Lady Florence Leveson Gower).
17	„ guards van	175	Perth (Conductor Harper).
18	Caledonian composite	123	Glasgow (Sir J. Anson's party).
19	W. C. J. S. „	44	„ (Mr. Still's party, Capt. Powell & Mr. Core).
20	„ third	64	„ (Mr. Westmore, Mr. W. Thompson, Mr. G. Thomson).
21	„ composite	56	„ (Mr. Roberts and party, Mr. Brown, C.E., Mr. Carter).
22	„ „	18	Ayr (Mr. Wark's party).
23	L. & N. W. family car	58	Stranraer.
24	Caledonian guards van	8	Glasgow (Frederick May).
25	L. & N. W. composite	1196	Carlisle (attached at Warrington, Mr. Wallace, Mr. Harrison, Mr. Forsyth).

Evidence.

In presenting a resumé of the evidence, it will be convenient to commence with the servants of the Company who were with the train.

Amongst the first to notice that anything had happened, was William Stawpert, the driver of the second or train engine (No. 1,212). He is a man of considerable experience, having been 14 years in the service of the Company. He joined the train at Crewe to drive it to Carlisle. On starting from the former place they were 19 minutes late. Fourteen minutes more were lost at Warrington, the last station they stopped at prior to Wigan. The journey thence occupied 21 minutes, so that it was 20 minutes past 1 on Saturday morning when they reached Wigan, with a view to pass through it without stopping on their way to the north. As they approached he found the signals both for the south and for the north of the station lowered; that at the junction cabin being as usual at "caution." Their speed was 37 or 38 miles an hour, somewhat less than they went sometimes, for the rails were "slippy," and their load a heavy one. He felt no unusual oscillation in crossing the various points at the entrance of the station, and they passed the building with their steam on. At the north end, on looking back, as was his duty and habit, to see whether he had all his carriages, he observed sparks flying from the wheels about two-thirds down the train. Immediately afterwards he felt a jerk as of part of the train breaking loose. He then whistled to the guards, and, shutting off his steam, he stopped the train gradually, as he knew not what had really happened, and feared that after the severance the hind portion might run into the front portion. They halted 559 yards beyond the north signal-cabin. The leading engine then went northward to Ryland's siding, to block the line, whilst he went back to ascertain what had occurred. He found that only 17 of the 25 vehicles were still attached to the engines; that the left side of the conductor's van, now the last vehicle, was smashed in; that the conductor (Alexander Harper) was much bruised and scarcely conscious; and he assisted him to alight. After this he proceeded to the station, and arriving at the end of the down platform at the south end of the building, he was, to use his own words, "so overpowered by the sight of the poor people in the wrecked carriages," that he could render no assistance, and retreated to the north signal-box. Ere he could return, help came. An interval elapsed, during which the injured were attended to, and Harper's van and the saloon in front of it were detached. Then he proceeded north with the remaining 15 carriages, not having examined the points, the signals, or the spot where the train left the rails. In reply to further questions he said they were not making up the time which had been lost, but were going at their usual speed, so that the accident could not be attributed to that cause. There were places where they went 10 miles an hour faster than at Wigan; and they had been through the Wigan station since the accident at a higher rate of speed than they were travelling on that night. Stawpert's statement was confirmed, and not materially added to, by Isaac Thirwell, the driver of the leading engine, who had been 8 years in the Company's service, and by the Firemen of both engines.

The guards and conductor had varied experiences of the accident. The under-guard, John Lambert, was in the van immediately behind the tender of the engine. He saw the signals were right, and second observed nothing unusual before the alarm-whistle sounded. He also corroborated the engine-drivers as to the rate of speed at which they were going. After the train had stopped he went and assisted the passengers; and later, at 2.52 a.m., he proceeded northward with the 15 undamaged vehicles, having made no examination of the spot where the carriages left the line.

Alexander Harper, who has been for five years a conductor between London and Perth, said that he had made up the train at Euston, and seen that the carriages were properly coupled. He had received no complaints on the subject, nor had he noticed any unusual oscillation during the journey. They were going at their usual speed, 35 to 40 miles an hour, as they approached Wigan, for they do not slacken speed for such places. It is rather "up brow" through the station, so they were going as fast as they usually go at that part of the line; but they were not making up the lost time; he had given no orders on the subject. He had just finished sorting the luggage, of which there was a large amount, and sat down on the off side of the van, and was looking at the signals. These were all right. There was no unusual motion at the first or second set of points, but a foot or two after passing the latter he felt the front wheels (he was confident it was the front wheels) of the vehicle wrenched as if they had run foul of some obstruction, and at once the van left the rails. Immediately he was thrown upon his back, and

tossed up and down amidst the luggage ; and, being struck on the head twice, he became a little stupified. On receiving the second blow he felt something, he could not say what, hit the van on the broadside whilst running over the sleepers ; but he believes it had previously struck the shunter's cabin. A succession of bumps followed till it was drawn on the line again north of the station. He got up, and applied the break, which had already been partially jerked on; and then he pulled the communication-cord, but he could not tell whether it acted. After the train stopped, he went with the guard May and examined the points; they did not try them, but they appeared quite right. There was no mark upon them, no strain, and nothing about them to account for the accident.

From one to three feet from the points northward, was a mark in the ballast, of a wheel, after it had left a rail. There were also wheel-marks, in the four feet and six feet spaces, in the ballast between the two main lines. He did not examine the loop-line at all, or see the signalman Goodall. He saw that the shunter's cabin was levelled to the ground, and believes the train separated there, on the coupling breaking at the end of his van; but he could not say how long it was after the first jerk. He was not aware of it till they were going against the rails. The remains of the Caledonian carriage were lying on the platform, wheels uppermost, and the body detached from it on one side. He went on to Perth in the train, and did not see the ruins removed. The train was longer than it had been for some time past. "Sometimes," he said, "long trains will swing a little more at the end than short trains, but it depends on the piece of line they are going over, and on tight coupling." He further stated, that they did not slacken speed going through stations unless there was an order to do so; as, for instance, when the permanent way was under repair. There were no regulations as to slackening speed, but this was done at some junctions, where there were sharp curves, but not at sidings. Nor were there any rules, so far as he knew, as to making up time; they invariably tried to effect this by getting away from the stations with a few minutes less stoppage than the time-bill allowed them.

Frederick May, the head-guard, whose van was the last vehicle but one, said they left Euston at 5 minutes past 8, and Warrington at 59 minutes past 12, 27 minutes late. He spoke in some detail as to the composition of the train, and the numbers of carriages. The returns, when compared with others, show it to have been the longest tourist train that had run this year prior to the 6th of August. His vehicle was the last before the saloon was added at Warrington. He noticed no unusual oscillation during the journey. On reaching Wigan, after seeing the signals were all right, he felt the sudden, but not unusual jerk of the train, as if he were going round the curve on to the siding, over the facing points ; and then there was a "quick slackening" as they ran some little distance. A moment after the jerk, the off-side buffer of the last carriage came through the end of the van, knocking the seat on which he sat from under him, and throwing him down. He cannot say whether his van took the siding rails from the points, as the night was so dark; but he thinks it did, as he believes he felt no oscillation till within 20 yards of the platform. Before he could get up to see what was the matter, his van began to rock and roll both ways, and he found it was off the rails. At length it stopped, erect, with its wheels in the ballast, and the steps dragging against the platform. After five minutes he was able to get out through the window of his van; and he found immediately opposite to it, on the platform, the Caledonian carriage No. 123 (the 18th vehicle of the train), with its wheels uppermost, and its body broken away and destroyed. About this carriage four or five passengers were lying dead. He ascertained that 17 vehicles had gone on with the engines, leaving 8 behind. He was too much confused at the time to be able to give the precise position of those 8 carriages after the accident. Part of one went through a wall, into the foundry on the west of the station building. It appeared as if the centre of the carriage had caught the roof wall at an angle, and it had been broken in halves. About four other carriages were lying in a heap in front, jammed into each other. The last carriage behind his van was, he believes, off the rails.—It may be mentioned here, that both the last vehicles were undoubtedly off the rails ; for the men who put them on the rails, and had to move them 30 yards in the ballast for that purpose, were called before us.—About 10 minutes after he got out of his van, he noticed that the signal was at "danger," but he does not know when the arm was raised. Soon afterwards he went with the conductor and examined the points. He agrees with him as to their being right. He further stated that the first mark of the vehicles leaving the line was in the ballast at from 8 to 10 feet on the north of them. He saw nothing there to account for the carriages running off the rails. He says the Caledonian carriage, No. 123, was about the same size as the other carriages. It was neither new nor old, but had as good an appearance, and was in as good order, as any in the train ; it seemed to fit all right when coupled to the others in London. Nor were the coupling irons loosened by the journey; and he had examined them since they were broken, and found no flaw in them.

Evidence of Passengers.

In the evidence of the passengers we find the experiences of the journey detailed in the strongest possible contrast. It would appear that few of the occupants of any carriage prior to the 15th vehicle in the train knew that such an accident had occurred. In consequence of the reticence of the officials and others, in order to avoid a panic, they went on their way northward, after an interval of an hour and a half, mostly unconscious of the ruin and havoc they had left behind them.

Mrs. Hering, of Ormidale, Brodick, Ardrossan, wrote that she and her husband and some friends were in the 5th carriage (as we gathered from the number which she gives,) of the train. It was a six-wheeled one, and very uneasy ; and it oscillated to such an extent that it was impossible for Mr. Hering, who is an invalid, to lean back. She complained to the guards and conductor. They had determined to leave the train at Preston on account of the shaking, but it was so much less after the accident that they went on to Scotland. Their carriage was decidedly lower than either of the carriages before or behind it.

The Rev. C. W. Dod, one of the masters of Eton College, was in the 12th carriage. As he travels a good deal by fast trains, and is in the habit of timing the speed and taking observations of the gradients during his journeys, his evidence is valuable and interesting. He said, the journey was well conducted in every way; and the pace between the stations seemed to be what it should be. The train was full, and time was lost at the stations in accommodating the passengers. The locomotive power appeared very good, as they went up the inclines at a good speed. He remembered that up the Madely incline the pace was very good, and the train was steady, with not more than the usual oscillation. He knew they were going into Wigan; he was looking out of the window, and distinctly recollected the usual double jolt in passing the facing-points. There was a sudden jolting when they were about 20 yards beyond the facing-points. Immediately afterwards, when his carriage was level with the station, he felt an extraordinary shoot forwards, as if they were shot from a catapult, the motion being perfectly smooth for 20 or 30 yards, like going down a steep incline, but he noticed nothing more. Everyone in the compartment remarked this. The passengers on the back seat bobbed forward, but were not thrown off it. The train stopped about 500 yards north of the station. Mr. Dod then looked out of the carriage, but did not leave it, as the night was very dark, and he fancied the line was blocked in front. He thought the speed of the train was from 40 to 45 miles an hour at the time

of the accident. He and his fellow-passengers were ignorant of the accident till they reached Stirling. At Perth, the conductor said he thought the points must have been moved.

Near the centre of the train was Mr. Parsons, a banker of Oxford. He wrote that the carriage in which he was, oscillated very much during the journey. The couplings were looked to at Stafford, but found right. The guard said the oscillation was owing to such a heavy train coming down the incline, for that all the carriages were alike.

Mr. Matheson, of Ardross Castle, with his family and servants, occupied the 15th carriage. He wrote, "All passed so rapidly, there is not much to state." The long train was travelling at a great speed. On nearing Wigan he was asleep, when he was awakened by a great jolt which nearly threw him off the seat on which he was lying. It was repeated three times, and was accompanied with much shaking; the third jolt appeared to put everything right, and the carriage ran on smoothly till it was stopped on the north of the station. Mrs. Matheson, who was in the same compartment, also noticed the three jolts, and that they were accompanied by a swerve to the west. Their boy, who was lying along the north end of the next compartment, was nearly shaken off the seat on which he lay. A portmanteau was thrown westward from a table. None of the party thought they were off the line. Mrs. Matheson thinks the accident began with their carriage, because only the occupants of their carriage and the one next behind it got out to ascertain why they had stopped. It was only at the end of half an hour that gentlemen began to stroll down to their end of the train. Mr. Matheson and his party knew what had happened, but very prudently kept silence. His carriage afforded shelter to the occupants of the 16th carriage, and the train proceeded.

Lady Florence Leveson-Gower, who was in the 16th carriage, wrote that she was alone in it with Miss Bragge, and they were both asleep, when they were suddenly aroused by a violent shock. It appeared to her as if they were going over something on the line, and immediately after she felt they were off the rails, from the tremendous jumps the carriage gave. This lasted, she supposed, for two or three minutes, when they felt themselves jerked back again on the rails, and the train stopped. She was uninjured, but Miss Bragge received some contusions, and was a good deal shaken.

This account is similar to that of the conductor, Alexander Harper, already given, who, it will be remembered, was in the 17th vehicle.

The 18th carriage was occupied by the late Sir John Anson and his party. Miss Ella Anson wrote, that they joined the train at Rugby. Sir John, reading the words "Caledonian Company" painted on the carriage, said, "We are fairly off for Scotland now," which makes her sure that it was a carriage of that company. They were in a first-class compartment, and their servants, including a lady's maid named Arlett, who was killed, were in another compartment of the same carriage. The train went on quite smoothly till they came to the points at Wigan, when it gave a severe jerk towards the left. Sir John Anson and herself had only just time to look up at each other when the carriage sprang to the right on to the end of the platform, and their compartment fell over with a crash, partly on the platform, but principally on the main line, throwing her sister, Miss Louisa Anson, out on to the up line, and leaving her under the pieces. It was perfectly instantaneous, and they felt none of the oscillations spoken of by the occupants of those carriages that ran as she thought up the loop line. Their carriage was lying furthest from the station, the back part of it, in which the servants were, being caught, as they thought, by the following carriages, and thrown over bottom uppermost; while the top, completely smashed in, was a yard or two nearer the station. She is sure of this, because she knows where Arlett was lying after the accident. The portion of their carriage that was thrown on the main line had, of course, to be cleared away for the traffic to proceed. Miss Anson and her party thought the Caledonian carriage was of smaller dimensions than either the preceding or following ones, and that it was old; but it was stated before us to have been nearly of the same size as the others, to have been built only in 1870, and to have been repaired so recently as last May.

Mr. Still, J.P., of Mountfield, near Axbridge, and a party, including his wife and son, and Captain Powell, of the Wiltshire Militia, occupied a first-class compartment in the 19th carriage. Mr. Still, who was slightly injured, said the train travelled steadily, and that they had remarked upon it; he felt no shaking or anything particular before they left the main line; they were all nearly asleep. His first experience of anything being wrong was the bumping of the carriage; then he felt it rise suddenly, and run a short way, then it turned right over, and slid along on its side. He thought their carriage was saved by running up the platform. Soon they managed to get Captain Powell out through the window, and afterwards they all followed him. He did not know whether their carriage was the first to leave the rails; he had examined the spot since, and could form no opinion as to the cause of the accident. His son gave confirmatory evidence.

Captain Powell appears to have been first roused by the carriage falling over on its right side, and hearing the breaking of glass. They seemed, he said, to slide along upon the platform, and to be brought to a stand as if an engine with a break had stopped them in the quietest way possible. Then they struck a match, and found the windows above them, and he was helped to get out. Mrs. Still was a good deal injured.

Mr. Core, of Dolphinton, Edinburgh, who was in the rear compartment of the same carriage, wrote complaining of previous oscillation, and thought the carriage was not properly screwed up at his end. In his opinion the vehicles which were upset lost their balance through the great sway they obtained immediately prior to the accident.

Mr. Westmore, of London, wrote that he was in carriage No. 64, the 20th of the train. It was long and full of passengers, and stayed more time than usual at the stations on the journey. They were 24 minutes late on reaching Warrington. Soon after leaving the latter place the speed increased, the oscillation being much greater than it was before, and he thought they were running at more than 40 miles an hour. On reaching Wigan station he felt a great jerk, as on passing points, but somewhat stronger than usual; and almost immediately afterwards the carriage commenced bumping and swaying till it ultimately turned over. In his opinion the points were not properly locked, or the train could not have run off the main line. He regretted that he was too much injured by the accident to attend the inquiry.

In the same carriage, probably, was Mr. William Thompson, of Devonshire Street, London. He said he joined the train at Euston for Glasgow; he could not complain of any oscillation of the carriages, they were travelling smoothly prior to the accident; but he thought they ran at a very high rate of speed after leaving Warrington. They appeared to slacken speed before they reached Wigan. He was seated in the offside corner of the front compartment with his face to the engine. Mr. Fraser, who was injured, and six other gentlemen, were in the same compartment. The first thing that he noticed was "a dull sound" of metal striking metal, as if they were passing over points, and being quickly shunted to a different line of rails; he could not say whether the sound proceeded from their carriage or from the one in front of it. The speed appeared unusual and dangerous, he rose and looked down towards the wheels through the window without opening it. Though it was too dark to see surrounding objects, yet it was plain to him they left the line about that point, judging by the immense sparks and

the ashes which he saw flying from beneath. It was possible the carriage might have gone a few yards on the rails, after he heard the sound of striking metal, but he believed they went the whole distance traversed afterwards completely off the rails. There was a good deal of jolting, though not so violent as might have been expected, but the carriage did not by any means run gently forward. He had just time to resent himself when the carriage stopped and turned over. The shock of stopping turned it over. It had received a violent side blow, not from the shunters' cabin, but probably from collision with the carriage of which a part went into the foundry. The whole thing only occupied about two seconds. He got out easily, as the roof was off; all the woodwork of the compartment was splintered. He found the débris of the carriage was lying two or three yards south of the refreshment room of the station, with the roof towards it. Afterwards he went to the south end of the platform, and looked at the position of the points, and saw that the distance to be traversed, 80 to 100 yards, corresponded accurately with the time which he thought would have elapsed between the "sound of striking metal" and the overturning of the carriage. He did not examine the points or the ballast.

In that carriage, apparently, rode Mr. George Thomson, watchmaker, of New City Road, Glasgow. He joined the train at Warrington. He thought the speed was unusually rapid. When they came to Wigan their carriage suddenly lurched, and ran round on to the siding, and then turned on its side. The arm of one person was broken in his compartment. It was so dark they could not see; at length some of the passengers got through the window, and, saws and hammers having been procured, a larger hole was made, and they were all liberated. He saw a number of medical men arrive soon after the accident and do everything in their power to alleviate the sufferings of the injured.

In the 21st vehicle in the train, the carriage which contained the unfortunate Mrs. Roberts, was Mr. John Brown, civil engineer, of Sutton, Surrey. He stated, that he was riding in the last compartment but one of that carriage, a second-class one, there being a third-class compartment behind it. The speed, with one or two exceptions, was generally very great. There was so much oscillation that he and the other occupants of the compartment could not make themselves comfortable, or go to sleep. He could not particularize any places where they went faster than others, but he remembered that before it got quite dark they were going at a very great speed. He was dozing, not actually asleep, when the accident happened; the first thing that he noted was a sudden jerk, followed by a swerve similar to that which he had often experienced in going over facing-points at a great speed; and he thinks the carriage went a few yards on the rails before it left them. Almost immediately, however, there was bumping over the sleepers till the final crash came. It appeared to him that the carriage ran pretty well up the siding till it struck the foundry wall, through which part of it was forced after it had been cut away. He fortunately escaped with a bruised knee; their end of the carriage was almost on the ground, lying over at an angle. When he got out of the carriage he could not get on to the platform, as he was shut in by two other carriages. He devoted himself after the accident in rendering all the assistance he could to the passengers, and did not examine the spot in a professional light, which he afterwards much regretted; he did not notice the points or the tracks in the ballast, but he remembered that the coping stones of the platform were shifted and injured a good deal in getting the carriage back again. The carriage in which he rode was not, he thought, so much broken up as had been represented, but was almost entire. He remained there till 7 o'clock in the morning, and saw the carriage which had been the last in the train drawn back along the ballast on to the rails.

Mr. Walter Henry Carter, a manager for a firm of wool dealers, of 68, Pine Street, New York, America, was in the same compartment as the last witness. He said that he managed to sleep from London to Warrington, he then woke up and afterwards slept again till he was disturbed by the terrible oscillation of the carriage. He was lying down on the seat, and was nearly jerked off it, saving himself with his hands; and he then remarked to a fellow-passenger on the terrific speed they were going at. He could not say how long this occurred before the accident, but it was after Warrington. He went to sleep again, and before very long he was again awakened; he jumped up from his seat; and two seconds after that, probably, he was pitched down by the accident occurring. He believed there was oscillation throughout the journey. He was wedged in by the accident for about 15 minutes, the carriages forming a triangle immediately in front of their compartment. Then he got out and went and had his eye, which had been injured, attended to. He could not tell the exact position of the carriages, as it was dark at the time of the accident; he had not supposed he was in the same carriage as Mrs. Roberts, as their vehicle was not so very much broken up. He was afterwards for some time upon the platform, and saw the gang mending the rails, but he did not examine the points or the tracks.

Mr. Andrew Wark, of Highgate, London, (whose severe loss in the accident is so well known and heartily sympathised with,) was in the 22nd carriage, in the right hand corner, with his back to the engine. The first intimation he had of anything being wrong, was a noise which awoke him thoroughly, followed by screams. Some one in the compartment called out that there was something wrong, and he had just time to pull himself up into the corner in as small a compass as he could when the accident occurred. His first sensation was a violent jerk from left to right as if the carriage had suddenly gone off to the left, without quitting the line at once; there was no tilt in the movement. After that succeeded a moment or two of comparative smoothness; then a jumping of the carriage over some rough way as if crossing over rails, followed by a sudden drop, as if from some little height; then comparative smoothness, as if, though off the rails, they were going quietly over sleepers; after that there was a moment as if they were stationary, and when he thought they were cushioned into the next carriage in front. At that period he imagined they were safe, but immediately after their carriage was smashed, by the one behind it knocking the end in, and driving the compartments together. It remained on the siding, and quite straight, at a distance from the platform further than he could step.

Passing by the 23rd carriage, and the guard's van, No. 8, occupied by Frederick May, we find that Mr. Henry A. Forsyth, of Manchester, was in the last compartment but one of the last carriage in the train. This vehicle, it will be remembered, was attached at Warrington. He was wide awake; they travelled very easily; he noticed nothing prior to the accident. It was very momentary; first of all there was a grating of the wheels and rails as if a break were on; then there came a frightful crash, and he and his eldest boy were thrown completely under the seats. He lifted up the boy and jumped with him from the carriage which was, he believed, on the rails, but he did not examine the place after daybreak. He was sure they had not run foul of the platform, from the ease with which they were going. All the crash he felt was in consequence of their running into the carriages in front. There was no bumping prior to the sudden stoppage. The grating, as if of the points, was the only thing he noticed.

In the same carriage was Mr. John Wallace, of Green Street, Manchester. He said that he joined the train at Warrington, and that the first thing unusual that occurred was a violent jerk, which seemed to throw

them off the line at once; then there was bumping, as if they were running over some very hard substance, harder than sleepers, and then they ran smoothly till the carriage stopped. A minute after he jumped out, and the carriage was then two feet from the platform. He believed the carriage struck the platform, though he was not aware when this was done. The carriage appeared to be a little higher at the front, because the buffers had gone into the guard's van. He was not sure whether the buffers were actually through the van when they stopped. Afterwards, on looking at the line, he saw a piece of rail, about $1\frac{1}{4}$ yards in length, broken clean out from the loop-line as if cut by a knife. The coping stones of the corner of the platform were broken for about $4\frac{1}{2}$ yards, but not so much, he thought, as was represented in the diagram; there was, moreover, a great big rut, about nine inches or ten inches deep, the exact length of which he could not specify. This rut did not extend as far as the platform, it was nearer towards the station, and a little bit ahead of the broken rail. He noticed these things about fifteen or twenty minutes after the accident, and before the carriages had been moved. There were not many people about then, but 25 minutes later a great crowd arrived. He did not know the cause of the accident. He further stated that at Warrington the guard, May, objected to their carriage being put behind his break-van; but the porter who was doing this, said that he was ordered to do so, and had done so frequently. May replied, "Well, it is not safe to send that carriage up the incline with those couplings."

Mr. Thomas E. Harrison, of Quay Street, Manchester, was also a passenger in the same compartment. He noticed nothing very unusual beyond rather more oscillation, and that it was noisy. He was awake at the time of the accident, and the first thing he knew of anything going wrong was a sudden lurch to the right; and he felt they were at once off the metals and running over the ballast. It was very rugged indeed, and he stuck to the seat, and was knocked about right and left until they came to a stand. They were bumping and jumping all the way from the first lurch till they stopped. It was just as if they were going over sleepers, and all the time they could hear the smashing and crashing of the other carriages. He got out of the carriage immediately, and going round it, saw what had happened. Their carriage stood so close to the rails, though off them, that he could step from the platform into it. He did not go to the facing-points, but he observed that the ballast was cut up, as he had seen ballast many times when waggons had been off in goods yards. He noticed that the coping stones on the edge of the platform had been torn up all along where the carriages had gone, and he thought the diagram correct in this respect.

Both this and the previous witness stated that an engine accompanied them from Warrington for some little distance, and pushed them behind. Mr. Harrison said that he looked out of the window and saw the engine doing this; and both he and his companion felt and heard the engine behind them pushing their carriage; but the inspector in charge of the Warrington station, and other witnesses on the part of the Company, declared this not to have been the case. The evidence they gave was conflicting and uncertain; but as it was a matter not in any way affecting the accident, however important it might be in the history of the tourist train, we thought it unnecessary to pursue the subject further.

Evidence of Spectators.

The officer of the Company in charge of the station at the time of the accident was Inspector John Price, who, together with two porters, was standing about the middle of the down side (western) platform of the station, between the main and loop-lines. They all three observed sparks flying from the wheels as the train approached the station, and that luggage was being scattered, as it passed them, from the near side of the van which was then the last vehicle in the train. The porters were beginning to collect this luggage when a gentleman came up, and inquired "what station it was?" and drew their attention to the catastrophe. It thus appears, and it is one of the most remarkable facts in the whole case, that they were so absorbed by what was occurring on the main line, and so deafened by the noise of it, that they were altogether ignorant that a large portion of the train was lying in ruins within the station. They all seem to have acted on the occasion with promptness and energy. The station-master and other officials having been summoned, and medical assistance sent for, the inspector went at once and questioned the signalman, Joshua Goodall, who was in the signal-cabin, as to the cause of the accident. He replied, "he did not know." The inspector then went and examined the points, and found them perfectly closed, and returned to help the sufferers. These statements were corroborated by four Post Office Officials who were on the same platform, and by the Booking-Clerk, and the Telegraph-Clerk, who were in their respective offices at the time, and by Thomas Alker, a forge foreman, who chanced to be near the refreshment room, on the same side of the station. But the nearest spectators of all were the Driver and Fireman of an engine used for helping trains up the incline, called the Bank-Engine, which was standing at the time in a siding six or seven yards south-west of the now notorious facing-points. Their statements, however, throw but little light upon the disaster. They say that the night was very dark. They noticed the train approaching at the usual speed, that it safely traversed the facing-points on to the next crossing; that it was then divided into two parts, and that fire flew from the wheels of both sets of vehicles. The fireman adds, that he could see the carriages going up the siding, and could distinguish some of them toppling over. These two men, having secured their engine, went and rendered assistance to the sufferers.

We reach at length a most important witness, Joshua Goodall, the signalman. His cabin was immediately opposite the scene of the accident, and the facing and other points, as well as the signals, near which it occurred, were under his control. He was subjected to a searching examination on the first day of the inquiry. It appeared that he has been in the Company's service three and a half years, and bore a high character. He said he had been at this cabin since May 1871, that the three signalmen attached to it worked on day and night shifts on alternate weeks or fortnights; that on Sundays they worked for 12 and on other days for 8 hours. He went on duty at 9 o'clock on the night of the 1st of August, and there was no one else in the cabin with him. There was no record-book in the cabin to enter the trains; nor would it be possible to keep one without extra assistance.

It is considered sufficient to record the passage of the trains and the telegraph-signals in the books at the cabin on the north, and at the canal-bridge on the south of the station.

Goodall went on to say that he took the signal for this train in the usual manner from Springs Branch, on the electric gong; that he asked the signalman at the north end of the Wigan station for permission to let the train pass; and that, having received permission, he put the signals right for the train to go forward. This locked the points of the main line. He thought it was then about 17 or 18 minutes past one, but he was not certain, as the last time he looked at the clock it was 10 minutes past one.

According to an entry in the record-book of John Byron, the signalman at the north end of the station, (which he stated was made at the time), this was done at 1.18. a.m.

Goodall stated further that he could see the train approaching almost directly after that, though he could only see it for a short distance, on account of the curve. As soon as he saw it coming round the curve he

put the distant-signal on, and immediately afterwards his electric gong was sounded to tell him that there was a train coming from Manchester. He then commenced to gong the Manchester train forward, but before he could give a second beat on the gong he became aware that the tourist train was off the road, or at any rate that something serious had happened to it, as he could see fire flying and the carriages thumping and knocking about. He at once put up his main line home-signal. What occurred afterwards for a few minutes he could not tell; he was confused and unnerved; he feared some part of the train might strike his cabin, but he was quite certain he did not touch a lever for three or four minutes. The whole of that time he was sitting on a bench, about four or five feet from the levers, on the opposite side of the cabin. Meanwhile the signalman at the canal bridge kept gonging to him for the Staleybridge mail; and the first thing he did when he came to himself at the end of those three or four minutes was to signal to him in blocking the line. In this statement he was corroborated by James Woods, the signalman of the canal bridge, who said that he did not receive the four beats from Goodall upon the mechanical gong, indicating that the line was blocked, till three or four minutes after the tourist train had passed him (1.16 a.m.); and he declared most positively, that the home-signal at the junction cabin was not turned to danger until after he heard the noise of the accident. This evidence, if it be believed, and it was given in a very satisfactory manner, proves that Goodall could not have moved either of the levers Nos. 7 and 9 in the frame (which worked points A and B in the diagram) during the progress of the train over the points, as has been suggested, because they would have been mechanically locked. Goodall admitted that the Staleybridge train above mentioned would be the next train to go into the loop-line, and that it would be necessary, by moving the levers, to open the two sets of points for that purpose; but he said that it was his duty to give five beats on his mechanical gong, by way of asking permission from the north signalman, before he altered his points and signals for the loop line; and if he did not receive an answer, permitting the train to go forward, he waited till he received instructions, especially in the dark; and when any train went up the loop-line the inspector usually came to tell him the line was clear. He said he had never raised his home-signal till all the vehicles in a train had passed, except sometimes during the day, when there were a great many trains shunting to and fro, and he could observe what was going on. He never did so at night, as he could not see well. He had never done so either by day or by night, since the issue of regulation (G), herewith forwarded. Even supposing the side-lights had been out he still had the roof-lamps in the carriages as a guide to tell him when the carriages were passing. One of the passengers, for instance, who rode in the last compartment but one of the last carriage said that one lamp in that compartment was burning well, and would show a good light through the windows; for by it shortly before the accident he had read a sailor's certificate. It was also suggested at one period of the inquiry that there might have been side-lights in the middle of the train, and that in consequence he (Goodall) had misjudged the length of the train, but this was disproved. He further said that he afterwards visited the points and found them uninjured and unstrained, and that they had worked quite right ever since. He had never known anything wrong with them during the time that he had been stationed at that cabin.

James Woods, the signalman on duty at the canal bridge said the tourist train passed him at 1.16; and John Byron, the signalman at the north cabin, stated that the train passed him at 1.20, with sparks flying from the rearmost carriage. Byron immediately signalled to Ryland's siding, the next cabin, to stop the train; but it was stopped, as we already know, by the engine-driver, not far north of Byron's cabin. Both Woods and Byron stated that the various signals that passed between them and Goodall throughout the night were correctly given, and all the witnesses who saw him stated that he was quite sober. Some weeks after the inquiry commenced we received information that Goodall was said to have been away from his cabin on the night of the accident; but this and another rumour relating to a former occasion were thoroughly sifted, and found to be without foundation.

Mr. Taberner, station-master of the Wigan station, said that he was called from his bed, and arrived at the scene of the accident about 20 minutes after it had occurred; and as soon as he got there he saw that everything possible was done for those who had been injured. At the earliest possible moment he went and examined the points, and found that they were uninjured, but that the heel-chairs of them had their inner jaws broken off on the near side. A very short distance from the heel of the points there were marks in the ballast, and in these and other similar particulars of the traces of the accident, he confirmed the evidence on that head which is more particularly alluded to elsewhere. He also stated that the traffic at the Wigan station was very great, and that they were very seldom free from shunting. There had been a considerable increase in the number of trains of late years. In July 1870 there were 41 up goods trains and 40 up passenger trains running through the station daily, and in the month of August in the same year there were 30 goods trains and 41 passenger trains on the down line; but at the present time there were 56 goods trains and 57 passenger trains on the up line, and 56 goods trains and 60 passenger trains on the down line through the station every 24 hours; though only four down passenger trains passed through the station without stopping. This did not include the horse-box train, which also ran through, but that train would be taken off after the 11th of August. There were also 14 down goods and mineral trains that did not stop. On the up line there were the same number of goods and mineral trains, and three passenger trains, passing through daily without stopping. The above returns, he said, did not include the "specials" or light-engines running through the station. During the season there were sometimes six or seven excursion trains a day. In addition to the above numbers, however, there were none on the day of the accident.

The tourist train, on the night of the accident, was soon followed by the Staleybridge mail train. The latter had waited at Springs Branch, a short distance south of Wigan, till the former had passed by. Benjamin Podmore, the driver, and George Roberts, the guard of the Staleybridge train, stated that they saw the tourist train pass at Springs Branch, and it appeared to go "all right." Soon after they followed, and proceeded as far as the Canal Bridge cabin, south of Wigan, where they were stopped. About twenty minutes later the limited mail came up behind them, and then it was determined that they should go on. They went up gently, and stopped clear of the station, below the bottom crossing, within 30 yards of "the facing-points." This was about half an hour after the accident. The driver then went to ascertain what had happened, and looked at the points and the tracks. His evidence was confirmatory of the evidence already given on these heads. About an hour afterwards, by the direction of the station-master, his train passed through the facing-points, and to the town side of the station, and the limited mail was then able to proceed on its journey northward.

David Naylor, the driver of the limited mail, said the tourist train passed him at Crewe, where he was waiting for it on his engine; nothing appeared to be wrong. He reached the Canal Bridge signal-station about 1.35 that morning, and his train remained there for an hour and six or seven minutes, when one of the railway officials from Wigan station brought it forward into the station on the wrong line; and at 2.43 it proceeded northward. He never left his engine.

and he therefore knew nothing of the condition of the points or the marks in the ballast, or other traces of the accident.

This witness was afterwards closely questioned as to a conversation that occurred the same morning after the disaster, at Carlisle, between Stawpert, the driver of the tourist train, and himself, as to the accident having probably been caused by the breaking of one of the axle-boxes of Harper's van; but the upper boxes were produced before us, and were found to be sound and in good working order; of the lower boxes three were produced, all broken by the noses at the end of the axles, from the van bumping over the sleepers; the fourth was never found, but its fracture was accounted for by its having come in contact, with great violence, first with the shunter's cabin, and afterwards with the south-east corner of the platform. Stawpert afterwards explained that this was merely an opinion he had formed on account of one of the near axle-boxes of the van being broken off. He was not aware at that time that it had been in contact with the platform. He had noticed no oscillation in the vehicles before the accident. Naylor further said he was in the habit of slackening speed through junctions to 25 miles an hour, and that the limited mail always stopped at Wigan.

The fireman of the limited mail, HENRY ALFRED IVATT, a highly intelligent witness, who had acted in that capacity since July 1872, and who before that had been a premium apprentice at Crewe, next appeared before us. Soon (about 15 minutes) after the limited mail stopped south of the Staleybridge mail, he went forward with a lamp and examined the points. They appeared all right, and he was not afraid to run over them. They were not twisted, they showed no wheel-marks, and they were quite clean. He said he was curious to find how such a thing could happen in the middle of a train, so he proceeded further to examine the spot. The first wheel-marks on the ballast were a few feet from the heel of the points. Some way up the loop-line he saw a piece of rail about two feet long broken clean out, with a chair attached to the middle of it, and lying in the ballast. This was afterwards shown to be the rail marked in the diagram as broken in two places. He also noticed some wheel-tracks in the ballast leading up towards the platform, which will be found marked on the diagram. He had heard that the last carriage of the train had no side-lights, but he did not think the signalman could have made a mistake on this account, and pulled the points over, as the train carried a tail-light. An accident might be caused through one set of wheels getting on the points, and the next pressing them open, but in such case there would be marks. He did not believe that the points could be opened by the signalman whilst a train was going over them at the rate of 40 miles an hour. It would traverse 17 yards in a second, and he did not believe it possible. He could not assign any cause for the accident. Both he and the driver noticed it was a full train.

THOMAS BENSON BELL, and JOHN ARMSTRONG, the guards of the limited mail, both of whom visited the points, confirmed the above evidence as to their condition immediately after the accident.

MR. HYATT, the station-master, and MR. ATKINSON, the platform inspector, of Stafford, and the CARRIAGE EXAMINER and GREASERS of that station in attendance on the tourist train, stated that it was in perfect order when it left that station, and that there were no complaints.

Similar evidence was given by the PLATFORM INSPECTOR, a PORTER, a CARRIAGE EXAMINER, a GREASER of Crewe, and by the INSPECTOR (unfortunately killed since by a train at Wigan) and the PORTERS of Warrington.

The SIGNALMEN at the various cabins between Warrington and Wigan said the train appeared to be running well, with no unusual oscillation, and at no extra speed when it passed their stations; and some of them noticed the side and tail-lights burning,—the side-lights on May's van, and the tail-light on the last carriage.

The SIGNALMAN at SPRINGS BRANCH, where there is almost, if not quite, as much shunting as at Wigan, added that he did not think it possible for the points to be moved whilst a train was passing them at the rate of 40 miles an hour, and that he had never known a train open points by the wheels getting on them.

EVIDENCE OF OFFICERS AND SERVANTS, NOT SPECTATORS.

MR. WORTHINGTON, the engineer of the northern division of the London and North-Western Railway Company, and the district staff of Wigan station for maintaining the permanent way, including JOHN GILL, JOHN HOUGHTON, and the PLATELAYERS gave evidence that the road was in good order and well constructed. By Mr. Worthington's direction was prepared the diagram sent herewith, which shows the positions of the carriages, and some of the injuries done to the rails and ballast.

MR. TOMLINE, out-door foreman at Crewe, and MR. DINGLEY, locomotive foreman at Springs Branch, the latter of whom was early at the scene of the accident, gave valuable assistance in the matters; and the former furnished the details of the damage done to various vehicles in the trains, which are sent herewith.

LIVESEY, the foreman fitter, in whose charge were the facing and other points near which the accident occurred, said that the points were not strained by it, but were in good working order afterwards. He had examined them, and they required no adjustment; no repairs could be done to them without his knowledge.

GUSTAVUS PARKER, signal-inspector over the signalmen and signal-apparatus for a district including Wigan, confirmed the evidence already given, as to the condition of the points, and the marks found in the neighbourhood. He was there at 5 o'clock the same morning, and looked at the signals; they were working well, and he did not then find the defect pointed out by Captain Tyler. The connecting rods of the points were all right, and the cotters in. The men employed at the Wigan south cabin, including Goodall, were all good men. He had never had to report any of them. He did not believe points could be pulled over when a train was going over them at 40 miles an hour. The greatest speed at which he had seen this done was 5 miles an hour.

MR. EDWARDS, formerly in the service of Messrs. Saxby and Farmer, now in the signal department of the London and North-western Railway Company, said he had had for the last 7 years considerable experience in signals, points, and locking, and was well acquainted with the different systems. He had examined the locking-apparatus in the junction-cabin on the south of the Wigan station. It was of an old pattern, and had been in use about $6\frac{1}{2}$ years. The parts were worn, but when the levers were worked in the ordinary way, they worked "right and correct." They were not of the same pattern as those made during the last 5 years, during which great improvements had been effected. However, the lever which worked the home-signal was interlocked with the lever which worked the points. The defect discovered by Captain Tyler was in the main line home-signal-lever not being properly locked by the lever of the facing-points; and was due to the wear and tear. The lever had to be pulled over sharply before the locking was effectually done; the signal-lever could otherwise be pulled over when the points were in the wrong direction. From the same cause the signal-lever could be moved when the point-lever was partly over and the catch not in the slot.

But it should be observed here, that this did not

He did not believe it possible for anyone to pull over those points when a train was going at such a speed as the tourist train was, but he had never tried the experiment. With regard to the chairs and rails, he noticed that the heels of two chairs were broken, which he thought had occurred through carriage-wheels alighting on them as they jumped off. This was all he saw. There were marks on the ballast where wheels had run ; they began about 4 feet from the points on the west side of the rail. He could not trace in particular the tracks of the carriages that remained erect on the line up the siding ; all the carriages appeared to have taken one track up the loop line after they had left the rails. They must have gone over the ballast, but he could not trace their particular tracks owing to the great destruction about. He saw tracks on the ballast from the points up to where the last carriage stood ; the tracks were not very deep, but were continuous. The first carriage that left the rails at the points would, he thought, guide the rest up the siding ; the first wheel that came off would get in between the rails, and would take the carriages up the loop-line following the rails, their wheels' flanges getting on the back side of the rails.

He went to ascertain the cause of the accident, and failed to do so. Various things might have caused it ; a light spring, or a spring-pin coming off at any part of the journal so as to cause a wheel to come off. If there were a six-wheeled engine, or a carriage with six springs, and any of them were light and lost their tenacity, the wheel would have a tendency to rise, and be liable to climb on to the top of the rail ; then a coupling chain or drag chain might break. He had thought the matter over most seriously, and examined the permanent way and rolling stock, and he came to the conclusion that the most probable cause of the accident was, that the high speed of travelling and the oscillation of the carriages caused the wheel of one of them to jump off, a few yards after the facing points had been passed. The wheel had, he thought, jumped between the rails and hit the loop line rails and broke the chairs. The destruction of the carriages up the line, in his opinion, proved that the train was travelling at a very high rate of speed, probably more than 40 miles an hour.

The Chief Officers of the Carriage-Departments of the London and North-Western and the Caledonian Railway Companies gave the following evidence :—

Mr. Bore, the carriage superintendent of the London and North-western Railway, said he had occupied that post for about 13 years, and during that period had control of the whole of the passenger rolling stock. For the last 10 or 12 years the standard height of their carriages from the rails to the centres of the buffers and couplings had been 3 feet 6 inches, the wheels being 3 feet 7 inches in diameter. Before that, the standard height was 3 feet 4½ inches ; and the wheels were 3 feet in diameter. To keep the buffer-line right, they put an extra block on the tops of the axle-boxes and at the bottoms of the springs, about ¼ of an inch thick in the case of the carriages constructed on the older standard, to bring them up to the higher line. At present, about three-quarters of their stock was of the modern height ; when they used the vehicles of the two standards together they always inserted the blocks to make the heights correspond. This was only done when the vehicles came into the works. The buffer-line in the train might not always be uniform, owing to some of the carriages being loaded and others empty ; but this did not happen so much from some being old stock and some new. Three inches would probably be the extreme difference in the buffer line ; this would be from loading, *e.g.*, all the passengers at one end. He had arrived at this conclusion from testing carriages in the works—not those that were running ; but, from observing the latter, he thought it the same in them, but he was not sure. Of course it would be rather more than this if the buffer line in the old vehicles were not set up. The carriages frequently lose three inches in height in the course of running. Break-vans would deflect four inches. Their standard was 3 feet 6 inches. The tracing supplied for the inquiry making it 3 feet 4½ inches was a mistake. The height had been raised through using a higher wheel, and though the tracing showed the height of the break-van and carriages at 3 feet 4½ inches, it was really 3 feet 6 inches. The vehicles were built, one in 1870, the other in 1871. He thought six-wheeled carriages safer than four-wheeled carriages—they ride more steadily, and are less liable to derangement ; and the springs would not deflect so much. If one end gave way, the centre wheels would keep up the carriage, and probably arrest impending danger. The play in the brasses was the same as in a four-wheeled carriage ; when the play is a little over ⅜ of an inch in the journal they are taken out, as there would be too much play. (The Caledonian carriage brasses had a play of ⅜ of an inch.) That is a point at which it would be wise to relieve them ; and this would be done if they came into the works, otherwise not. The carriage-examiners were under his orders, and would report defects to him, *e.g.* a broken axle-box, or a flaw in the spring, or a hot axle they could not cool, or anything that affected the running. He had had no report about any defect in any carriage in the tourist train, nor heard of any.

The witness at our request examined and measured the remains of the carriages of that train, and, on his return, said that the result of his examination was that the carriages varied in buffer-height, from 3 feet 7 inches to 3 feet 3 inches ; the working parts and tires were in very good working order, especially the tires and flanges. They had sustained a good deal of damage in the accident, by striking chairs. There were no broken springs except where rivets had been broken by the accident. In buffer-height Harper's van measured 3 feet 3½ inches at one end and 3 feet 7¼ inches at the other end, so there was a great difference, chiefly in consequence of the springs being down. The axle-boxes were partly out of their places, so that their position before the accident could not now be ascertained. He could not tell whether the axle-boxes of the guard's van had been broken by the accident, but he thought they had been ; he had looked at one of the brasses of the Caledonian carriage, No. 123, and it was comparatively new. He could not tell whether the axle-boxes were in good condition or not.

Mr. B. Connor, who has been superintendent of the locomotive department of the Caledonian Railway Company for the last 17 years, and has had charge of all the rolling stock, stated that he had been informed that the Caledonian carriage (the 18th vehicle) was No. 118, but on examination found it was No. 123. He then went and examined it, and on his return said there was no defect in the carriage to account for the accident. On a later day Mr. Connor produced a diagram of the carriage No. 123, which he said was made in December 1869. The contract for the carriage was made in that month with the builders of it, the Metropolitan Carriage Company ; and it was delivered and put on the line in April 1870. It was 3 ft. 6 in. from the rail to the centre line of buffer. It was designed to be the same as the nineteenth carriage, West Coast Composite No. 44, which followed it. Loading the carriages and the wearing of the tires would reduce the height, but not more than 1½ inches. Inside it was 6 feet 6 inches in height. Some of the London and North-western Railway Company's new carriages were 7 feet. The carriage was only three years old, and would last 20 years. Possibly it appeared depreciated through not having been washed lately. One of the plates of the spring of the off-trailing wheel was broken, he believed by the accident. The carriage had been repaired seven times since it was built. It was last repaired on the 23rd of April 1873, when it was lifted, and two new bushes were put in, and four springs

were adjusted; six springs were also repaired on its being examined on February 12th, 1873. It was a carriage that constantly ran backwards and forwards to and from the North, about 32,000 miles per annum. He asserted that the buffers of the carriages of the Caledonian and London and North-western Railway Companies running on this route were substantially on the same level. It would not be possible for there to be a difference of 3 inches in the height from the rails to the buffer line, unless the carriages were in bad condition.

The locomotive-superintendent of the London and North-western Railway Company, Mr. Francis Webb, stated that he had held that post for about two years. He reached the scene of the accident five or six hours after it occurred, and proceeded to examine the points, permanent-way, and carriages. First he looked at the points; the only thing he noticed about them was the fracture of the jaws of two of the chairs at the heel of them; there appeared no straining about them. About 29 ft. 6 in. from the nose of the points up the siding he noticed the mark of one wheel only in the ballast, but beyond that the ballast was all broken up. On the main line there were no marks on the rails; the ballast was knocked about where a carriage went over a station wall. He examined the wheels of a Caledonian carriage which lay wheels uppermost on the platform, and especially the draw-bars at both ends of that carriage; one of the axles was bent; but he thought that was caused by the accident. He examined the springs, and they were taken to pieces, and were found in good order. The couplings were very good; they had broken, and he could see the iron; but it was sound and good. He picked up one-half of the screw shackle at the end of the carriage facing north; the iron was very good. The shackle of the coupling of the other end of the carriage was found at the end of the platform, not far from where the shunter's cabin stood; it was very good iron and had a clean fracture, but had been torn off by a side wrench.

These couplings were produced before us and found to be of good iron. The witness further said that they had two engines to the train that they might run at a more regular speed, as the traffic at this time of the year was very heavy. If they had more than 16 carriages at this time of the year they would put on two engines; thirty-two vehicles was the extreme load for two engines, but they did not run more than 25 on account of the strain on the draw-bars, and the want of accommodation for longer trains at the station platforms. He superintended the mechanical department of the railway, and Carlisle was his extreme limit north. He was not able to say whether they had in their system a curve so nearly in connection with two sets of points, and a bulged rail, as there was at Wigan. He had nothing to do with the permanent way. If it were possible to pull the points over whilst the train was going at the rate of 40 miles an hour, that would account for the accident; but he scarcely thought it possible, and he never knew of a case of the kind. He was unable to assign any cause for the accident.

Mr. J. Rigg, the outdoor locomotive-superintendent of the London and North-western Railway, said that his department was under the control of Mr. Francis Webb; his duties specially related to the outdoor work and the control of the men. He had been 21 years with the Company, 16 years as outdoor superintendent. On the morning of the accident he saw the driver of the leading engine, who gave him, substantially, the same account as is stated in his evidence. From that he was satisfied there was nothing wrong as regarded the speed. No doubt when trains were running slower through shunting yards and facing points, and stations such as Wigan, there would be less danger than running fast. However, if the trains were to run through all such places at slackened speed, an hour more would be spent in the journey. There were 23 junctions between London and Carlisle, four stations where there was a great amount of shunting, and Weedon Swing Bridge,—in all, 28 places, where it would be necessary to stop if at Wigan. Some of these were stations at which some of the very fast trains did not stop; but the 8 o'clock train would pass through only 21 of them without stopping. There would be a greater risk if they were to run through in the same time as they did now, while reducing the speed at those places to 15 miles an hour. Of course, if more time were allowed, they could afford to slacken at those places to 15 or 20 miles an hour, and it would be safer passing through them. An extra half hour would not be enough if the Company were determined to run the trains to time. They are pressed by the public to run them in the time they do now. It might be that the companies running to the North were pressing each other to do this; certainly, slower speed going through crowded stations with facing points would be much safer than travelling at the high speed they are compelled to use now. He knew Rule No. 212, and he believed that it was thoroughly complied with. They might run through Watford and Tring at 30 miles an hour as safely as they might through Wigan at 20; the worst part of Wigan was at the Canal Bridge before coming into the station. Some of the drivers went through those stations more cautiously than others. He thought there was no place on the main line where there was a curve so sharp going through a shunting yard as at Wigan.

Mr. Shaw, the district superintendent of the London and North-western Raiilway Company, said if all the Companies would agree to run slower, or some legislation should be made upon the subject, it would be all the better; but that the London and North Western Railway Company could not be the first to do this.

Mr. Geo. Whale, an assistant locomotive superintendent of the London and North-Western Railway Company, said that his particular duties were the supervision of the outlying depôts north of Stafford, and to arrange the running of the engines, and the working of the men. He did not think there was any necessity to run at a lower rate of speed through Wigan than the tourist train did on the present occasion. The engine-drivers ought to keep a good look-out to see that they had the whole of the train with them over the facing points, but he did not think that Rule No. 212 meant that they should slacken speed. He did not think there was any breach of Rule No. 212 in their running through Wigan at 40 miles an hour. It would be better to try to slacken speed at such places; of course there was a little more risk at points and crossings than in the ordinary permanent way. Up to about eight or ten years ago there was a rule reducing the speed in running through junctions, of which Wigan was one, to the rate of 15 miles an hour, but that was before the locking apparatus was introduced. Though the extra traffic had increased the risk, this had been in a great measure met, so far as a collision was concerned, by the absolute block system. He thought other companies went at as great a rate of speed as they did.

For the purpose of comparing the rules in force on the Midland and Great Northern systems as to slackening speed, we summoned officers from both those Companies.

Mr. Hy. Herbert Loveday said he had been outdoor inspector of the Midland Railway Company between seven and eight years; he produced a copy of the working time tables of that Company, and of the special notices issued to their drivers and guards. In the appendix, dated February 1873, the regulations of which were still in operation, he found notice given that the speed of all trains running on passenger lines must not exceed five miles an hour in running through Normanton station. It was a difficult station, and there were facing points; in fact it was a station yard for passenger purposes. At Sheffield, on entering the station, these trains were not to exceed four

miles an hour. There were facing points, but it might be to protect the trains, if any, standing at the stations. No trains run through Sheffield. At Marple Tunnel the speed must not exceed 30 miles an hour, on account of the curve; and at Ambergate junction, ten miles an hour for the same reason; through Derby not to exceed five miles; at Sornton and Stanton Gate 15 miles, as they were flanked by a goods line on each side. At Wigston level-crossing they were not to exceed ten miles on account of the crossing; at Huntington curve it was ten miles; at Bedford 12 miles, but all the trains stop there now; at Stratford junction 10 miles; at Bow and Stepney junction the same; there was a great deal of traffic. At Ludgate Hill station four miles; at Blackfriars and Dover junction 15 miles; at Droitwich junction 15 miles; the latter on account of the curve. He was not aware of any notice having been given to the Midland Railway Company, with regard to running to their stations. There was no regulation which reduced the speed on their line applicable to such a place as Wigan so far as he was aware of, and he could not say whether the Midland Railway Company would frame any special regulation for passing through such a station. He would not reduce the speed for facing points alone; considering the recent improvements, they were one of the necessities of railways, though to a certain extent, perhaps, they increased the danger, but he would not slacken speed on account of them. He thought they might run 40 miles an hour round this curve and over these facing points, but 20 miles an hour would be safer. So far as he knew at present he would make no regulation for Wigan. The Midland Company ran fast expresses like every other Railway Company. Rule 77 of the Midland Railway Company enjoined engine men to use great caution on all occasions when passing junctions and through stations where their trains were not timed to stop, particularly where there were facing points.

Mr. Amos Pigott, the chief signal-inspector of the Great Northern Railway, stated that he had acted as signal-inspector on that railway for 15 years. The stations at which the Great Northern trains were, by the time-tables of the Company, ordered to slacken speed, were:—Wood Green, speed to be reduced to 25 miles an hour, for the main line up trains, on account of facing points; at Hatfield they were all (Scotch expresses included) restricted to the same pace on account of the curve. There were no facing-points there. The Hitchin station embraced a junction of four lines, and there they reduced their speed to 15 miles an hour, solely on account of the facing-points. This was kept to in practice. At Warrington junction, loop-line trains were restricted to 15 miles an hour. At Grantham, which was practically a shunting yard, the speed was reduced to 15 miles an hour; at Retford crossing and station six miles an hour; at Doncaster they were restricted to 15 miles an hour. There were four sets of facing-points on the down journey, and five on the up. At Shaftholme the Railway Company reduced their speed to 15 miles an hour on account of the sharp curve and the facing-points; at Selby station 15 miles an hour. There was a good deal of shunting there, and a swing bridge. The same rate of speed was maintained at Knottingley, where there was a very sharp curve, besides facing-points. These were the stations on the main line northward. If the trains went through Hitchin at a higher rate of speed than 15 miles an hour they were reported. This has happened many times. He had reported one or two cases at Retford this year, not elsewhere. The locking-apparatus was nearly perfected over the Great Northern system, but this would not, he believed, make any alterations as to the rules for slackening speed.

The evidence appropriately concludes with that of the two chief officers of the London and North-Western Railway Company.

Evidence of Managing Director and Assistant Director.

Mr. George Findlay said he was assistant to Mr. Cawkwell, the managing director of the London and North-Western Railway, and had been so for the last 10 or 12 years.

There were special regulations as to the slackening of speed over certain parts of the line where the gradients were steep, and other circumstances required a diminution, for instance, in descending steep gradients. They were contained in the working time tables of the company. The first rule directs the shutting-off steam at the Dunstable-branch incline; the train was to be completely under control. The next related to the Dudley branch, and to the ascent of the incline there. There was always to be a break to those trains. There were other provisions as to goods trains at Great Bridge, and using the breaks on that incline; and there were further directions that wooden spraggs to stop the carriages were to be carried, and applied instantaneously to the wheels in case of need. This only refers to break power. There was a regulation which prescribed that passenger trains must have extra break-power when the carriages in a train were more than eight in number. On the Merthyr, Tredegar, and Dowlais branch lines, the speed of the passenger trains was limited to 15 miles an hour, and the goods trains to 10 miles an hour, on account of the steep gradients. These were all the regulations for the reduction of speed, and none of them referred to the main line between London and Carlisle. There were no arrangements for the slackening of speed over that section of their line, other than Rule No. 212. The tourist train was a regular train, and was put on to relieve the limited mail, but runs only during the summer months, June 1st to September 30th, when the traffic is heaviest. The journey from London to Carlisle occupies about 7¾ hours, for the 299½ miles. The average rate of speed was 41 miles per hour, rather slower than the limited mail. There was a regulation, which he produced, that reduced the number of carriages of any passenger train of this Company to 25. If there were more than 25, the train would be divided; which was often the case during the season. He said the company had paid great attention to the speed of the trains, and their punctuality. A special committee was last year appointed to consider these points. During the last year they had practically revised their time tables, and given more time to all the stopping trains except the mails, and also more time to the goods trains, and had laid down some fixed rules, so as to give a greater margin for the arrival and departure of trains, and also for the shunting of goods trains, and so keeping the main line clear before the ordinary passenger trains were due. The speed of the trains on the London and North-Western Railway was, in fact, not so great as that of the other great companies. The journey from London to Liverpool occupied generally about five hours, whilst the journey from London to Leeds was run by the Great Northern Railway Company in 4 hours and 35 minutes. About 15 months ago the question of a further acceleration of speed was raised, by the Great Northern Company running to Edinburgh in 9½ hours; the London and North-Western determined to give an hour more for the journey. They did not make so fast a journey as that between London and Leeds, or that between Exeter and London. Some 12 months ago there was an attempt to come to some arrangement amongst the companies to limit the maximum speed to something like 40 miles an hour, and one company did move this, but it was objected to by other companies more particularly concerned in the East Coast line interests, and nothing came of it. With regard to the line from London to Carlisle, from what the witness knew of it, and what the directors had done to make it the best permanent way, no expense had been spared. Looking also to the block-telegraph and the adoption of the locking-bar, he felt no hesitation in saying, in the interests both of the railway company and of the public, that 50 miles an hour was a speed

circumstances. This vehicle may draw carriages off the rails in front of it, or drag carriages off the rails behind it, more or less suddenly, and with more or less serious results ; and these other vehicles so drawn off or dragged off may again meet with diverting causes which may lead to further complications. In this case there were a number of such diverting causes. There was—vide diagram—the off rail of the loop-line, and there were the check-rails on that line. There was the near rail of the Lancashire and Yorkshire junction down line. There were the rails of a siding crossing the loop-line towards the down main line, and there were the slip-points and connections between this siding and the loop-line. Passing along from the facing-points, there were further indications principally to be noted,—of a check-rail indented at 80 feet, and a check-rail knocked out of its place at 102 feet, on the loop line; of a chair marked at 115 feet on the near rail of the Lancashire and Yorkshire down line, and of broken chairs at 158, 161, 172, and 174 feet respectively, under the near rail of the down main line; of a rail broken and distorted at 200 feet in the siding crossing the loop-line; and of a rail broken in two places, and rails marked in two other places near it, on the offside of the loop-line. These and many other indications are all of value, and must all be considered in their proper relations to the cause of the accident. But the question to be determined, and to which all others must be considered subordinate, is "How did a near wheel of "some vehicle in the train get on the wrong side of "the near tongue of the facing-points?" That was apparently the first thing to happen, and was the prime cause of all that followed. It is the main fact round which all the other facts must be ranged, and the problem to the elucidation of which all the evidence must be made to contribute.

The most obvious mode of accounting for the accident would naturally be the shifting of the points by the signalman during the passage of the train. This would be at once, if it could be believed, a satisfactory explanation of it, would remove all further difficulty, and would render easy the recommendation as to how such an accident could be avoided in the future. The proper application of a locking-bar in front of the facing-points would prevent a future signalman from again making such a mistake, or from moving his points, even if he tried to move them, until the last wheel of a train had passed through them. But while there are important reasons on the one hand for coming to such a conclusion, there are, on the other hand, great difficulties in the way of sustaining it. The grounds for this belief have been put forward with great ability by Mr. Burrows, C.E., of Wigan, who was employed by the coroner for the borough, Mr. Darlington, to investigate the circumstances connected with the accident, and who has taken much pains in doing so; and the difficulties in the way of it were to some extent brought out during his examination. The broad facts,—that the two engines and tenders and fifteen vehicles passed through the facing-points in the right direction,—that the 10 last vehicles of the train were diverted from the main line, or thrown off the rails, immediately to the north of the facing-points, —that so few marks were visible, or could be ascertained, to indicate where these ten vehicles had all left the rails of the main line if they did not run along the rails of the loop-line,—that two (if not three) of them, with the débris of a third (or a fourth), remained on their wheels over the loop-line, but off the rails, after the accident,—and that the next following train would have passed through the points along the loop-line,—are all separately, and still more strongly when taken in combination, in favour of the view that the points may have been shifted whilst the latter part of the train was passing through them. But they further tend to prove that if the points were thus shifted, they must have been pulled completely over; and this could only have been done by the signalman from the junction-cabin.

If the points had been pulled half over, so as to allow any two wheels of the train to get astride of them, as it is technically termed, then, in consequence of the difference in gauge between the wheels and the tongues at the heel of the points, and of the force which would have been exerted during the passage of the wheels over the tongues, there would have been marks to indicate that such had been the case ; and, at all events, if the points had been thus shifted, it cannot for a moment be supposed that a number of vehicles had passed over them whilst they were in such a position. If the points had been pulled over into any intermediate position, they would have been struck by the passing wheels, and very evident indications would afterwards have been observable upon them of blows from those wheels at a speed of 38 or 40 miles an hour. And, in carrying out both of these latter suppositions, it is necessary to believe further that the signalman, after partly opening the points for certain wheels of the train, pulled them completely over for the passage of the vehicles behind them.

If, again, the tongues of the points had become disconnected from each other, it is necessary to account for not merely one, but two spring-cotters having fallen out, of which there is no evidence whatever, —for the off tongue having been moved over to the eastward in some unexplained manner after the passage between it and the standard-rail of the off wheels of the two engines and tenders and at least sixteen vehicles,—for the cotters having been replaced after the accident,—and for the concealment of all evidence as the condition in which they were found. And, further, this theory of the accident is not in accordance with the first indications on the permanent way, in regard to which so much has already been said. Those indications point to considerable pressure against the heel of the near tongue from the *outside*, by which only the inner jaws of the heel-chairs would have been fractured ; and to the fact that the same wheel which caused their fracture was still close to the outside of the near main line rail, as evidenced by the marks on the chairs and keys at 29 and 32 feet from the ends of the points. But if an off wheel had in the first instance run along the off tongue after it had from any cause fallen over or been pushed over towards the standard-rail, and if the corresponding near wheel had been forced over the near tongue, then the pressure would have been westward in place of eastward from such near wheel ; then the inner jaws of the heel-chairs would have remained unfractured ; and then the marks would not have been found, as they have been, on the chairs at 29 and 32 feet.

If, once more, there had been an obstruction between the near tongue of the points and the standard-rail sufficiently large—say $1\frac{3}{8}$ inches—to enable the flange of a near wheel to pass on the wrong side of that tongue, then, as has been proved by experiment at these particular points, the signalman would have been aware, by the increased force necessary to the working of his lever, that such was the case. Inasmuch as the two engines and tenders and at least 15 carriages passed through the points properly and safely, it is extremely unlikely, to say the least, that there should have been any such obstruction ; and the passage through the points of the former part of the train would have tended to close the near tongue towards the standard-rail, by the pressure against it of the flanges of succeeding wheels, rather than to have increased the effect of the obstruction. Any material forming such obstruction would, further, have been found in the points after the accident ; and there is no reason to believe that any such obstruction existed.

In order to determine whether by any possibility the action of the wheels upon these particular points could cause them to spring or to open vertically or laterally during the passage of the train, we caused, on the morning of the 5th of August, trains to be run through them at high speed, and tested them in various ways, but we failed to discover any mode in this way of accounting for the accident. The slight movements which were apparent in the tongues under such

can slacken speed if he thinks necessary. He thought the trains might run safely at their present speed; it would be more economical to run at a less speed. The public required fast trains, and they could not travel at a less speed, to make it answer. Certainly they could not do so till other companies did. The public did not travel so fast to Scotland by the London and North-Western as by another route. The limit prescribed by the Post Office authorities for the limited mail was 4 passenger carriages, 12 vehicles altogether. The public required fast trains; he knew this because they always went by them especially on long journies, third-class passengers especially chose those trains. The East Coast Companies had always carried more than the West Coast Companies, because they went faster. He did not know that it was because they could stop conveniently at York. To the north of Scotland the numbers were different, for there, with the time the same, the London and North-Western Company carried the greater share of the traffic. They had made some alteration in their trains some time ago, reducing the speed; and the other companies expedited their trains, he believed. He did not doubt the other Companies ran as many carriages on their trains as they did at that time of year; he did not know whether they were lighter carriages. There was little difference in the speed of the tourist train and the limited mail, as the latter consisted of 12 vehicles drawn by one engine. Dividing trains so much rather increased risk. It is the station master who directs what number of vehicles are to be attached to a train. This year the extreme number of carriages to be attached had been reduced from 29 to 25.

He thought Rule 212 was merely an instruction to the engine-driver to take great caution in approaching junctions or busy stations where there were facing-points, to see first that everything was clear, and then use his own judgment as to what further caution he should take in going through the stations. He might slacken speed if he liked, and found it necessary. If he were travelling very fast, he had no doubt he would slacken speed.

With regard to the speed of the trains, passengers often over-estimate it. He did not think the servants of the company under-estimated it. Caution in the rule meant looking out for signals and slackening speed. If they thought they were travelling too fast on approaching a station they would slacken speed. When Wigan station was clear, he did not see any obstacle to travelling at a fair speed through it. He saw no danger in going through in its present condition at 40 miles an hour. The same thing would apply to other stations like Wigan, where there was constant shunting; he believed the permanent way was kept in equally good order as any where else. It was a mere question of labour. He did not think there was any want of adjustment. They gave their engineers full privilege to do what they pleased with regard to the permanent way. It had lasted well for years. This was a proof of its being kept in good order. It required and received more attention at such places. He saw no danger, and therefore no objection to running through such a station at 40 miles an hour.

He had since the accident, however, told the drivers to proceed through Wigan station with caution, and not to run so fast through it.

Perhaps it was wise to do this, as the public had got an impression from this inquiry that danger was incurred from that cause. But he did not attribute the accident to the rate of speed. He did not think that the oscillation of the curve, even though it was only 60 yards from the two sets of points, would be felt in the station, or that the curve had any effect on the matter.

The rule No. 212 was made with his approval. He did not think the marginal note would mislead. It meant slacken if necessary, but the marginal note did not matter. They supervised the speed kept by the engine-drivers with reference to the time tables. The engine-drivers are not allowed to make up time, but they may do it, but not to a dangerous extent. Luggage, especially ladies boxes, made the trains late. So they had allowed more time. The engine-man should always have a time-bill with him by Rule 193. Rule 204 directs them to look out for signals.

This concluded the evidence of the witnesses, 104 in number,—69 of whom were servants of the London and North-Western Railway Company,—with the exception of that of Mr. Burrows, Civil Engineer of Wigan, whose opinions are fully discussed hereafter.

General Conclusions.

In searching for the cause of an accident of this description, there are various matters to be considered. The points might have been shifted wholly or partially by the action of the signalman, or by the action of the wheels of the train; or they might have been in a defective condition, or partly open by reason of an obstruction between the near tongue and the near standard-rail; or the connecting-rods by means of which the two tongues were kept at a proper distance from each other, and were made to act together, might have been rendered useless by the absence of the two cotters which secured them in their places. The permanent way might have been in a defective condition, as regards line, or level, or gauge, or otherwise. There might have been defects in the rolling stock, such as bent axles, wheel-tyres without proper flanges, axle-guards not vertical, axle-brasses having too much play on the journals, broken axle-boxes or springs, unequal heights of buffers and draw-bars as between different carriages, or unequal loading. Finally, there might have been a combination of certain of these causes.

In considering which of these causes, separately or combined, could have produced this particular accident, it becomes necessary to scrutinize narrowly the condition of the permanent way and the rolling stock—the state and the working of the points—the marks or absence of marks on, or damage or absence of damage to, the points, rails, chairs, keys, sleepers, or ballast—the marks on or damage to the different vehicles—the positions in which they were found after the accident—the modes in which they could have reached those positions—and, generally, the *course* of the accident—and the evidence of the various witnesses,—passengers, or officers or servants of the Company, or others,—who were in a position to throw any light on the subject.

The first facts of importance to be noticed in this instance are—that nothing material appears to have been wrong in the train, and no evidence has been adduced of any indication of the accident on the permanent way, south of the facing-points;—that a near wheel of some vehicle in the train was on the wrong side of the near tongue at the heel, and by pressure eastward fractured the inside jaws of the chairs on either side of the fish-plate at 14 and 16 feet respectively from the ends of the points;—that a wheel, and no doubt the same wheel, still hugging the outside of the near rail, tipped the chairs outside of the near rail of the main line at 29 and 32 feet from the point-ends;—and that there was a corresponding track on the ballast, of an off wheel on the inside of the off rail of the main line. These are the indications to which attention should more especially be directed. In all such cases, of trains leaving the rails, the first few marks are those which point most conclusively to the original cause, while the succeeding marks are more in the nature of results; and the further we advance from the first marks the more doubtful do the indications become. When once the flange of a wheel mounts and drops off on the outside of a rail, and the corresponding wheel drops inside the other rail, in a train travelling at high speed, and especially when the wheels so leaving their proper rails meet shortly afterwards with obstructions, or other rails, to divert the vehicle to which they belong from the direction in which it was travelling, then the consequences may vary materially, according to

vehicle itself would not have remained, as it did, in an upright position on its wheels, and run forward with the front part of the train through the station. It would inevitably have fallen over on its side, and would have met with something more like the fate of the Caledonian carriage behind it, which was, according to almost all available indications, the first vehicle to be diverted from its proper course. In any case, the same argument would, however, apply, as regards the fracture of the heel-chairs. The fracture of the inside jaws of those chairs would not be satisfactorily accounted for, by supposing the wheels to be turned by the shifting of the points up the loop-line.

Another difficulty that occurs in explaining the cause of the accident on this supposition, is that of determining the routes by which the various carriages reached the positions in which they were found after the accident. If the eight last vehicles of the train were turned up the loop-line, how, and why, and when did they *all* leave the rails of that line? No damage appears to have been occasioned to rails or chairs on the near side of that line, and with the exception of one rail broken in two places (at 232 and 234 feet) and two other blows received on rails at 226 and 254 feet, no damage was occasioned to the off side of it between the displaced check-rail at 102 feet and a point near the south end of the platform at 314 feet from the facing-points; while from 314 to 400 feet the off rails were displaced, and the two last vehicles of the train were, during their subsequent removal, obliged to be dragged some 30 yards south over the ballast before they could be placed on the rails. Looking to the positions on the diagram of the carriages which were left on the south of the station, the foremost of them, the Caledonian carriage, after being turned end for end and upside down, lay with its floor on the platform nearly opposite to the last vehicle which was over the loop-line, while its roof and part of its body were near the south end of the platform. The carriage which had been next behind it, No. 44, was next in front of it; the next in order, No. 64, was in front of the others on the west of the station buildings; the next, again, No. 56, was dashed to pieces, and partly forced through the wall on the west; the following carriage, No. 18, was, as shown on the diagram furnished by the Company, between Nos. 64 and 44; but the position of this carriage is, on the evidence, doubtful. Mr. Wark states it was erect, and not on the platform, but over the loop-line, and almost within stepping distance from the platform after the accident. The last three carriages only are found to have retained their proper order, but behind No. 56 in place of being behind No. 18, if the diagram be correct. Of these 8 vehicles, the three first, and perhaps, though this is doubtful, the fifth would seem, therefore, to have travelled from somewhere between the down main and the loop-line, over or past the shunter's cabin (or the site of it), which they destroyed and swept away in their course, up the slope of, and along or against the side of the platform; the fourth (No. 56), after following a similar course, to have been diverted from the platform in being forced through the wall on the west of the station, and the three others to have assisted in destroying the west side of the platform, or in displacing the permanent way on the *off* side of the loop-line. If any one vehicle had been found with even one pair of its wheels on the rails of the loop-line, that would have been a very convincing argument in proving that it must have been turned in at the facing-points and have run along the rails of the loop-line, or if any of the hindmost vehicles had got into their positions without coming into contact with the platform, there might have been more reason than now exists for the same belief. But neither of these conditions was fulfilled. These vehicles destroyed the shunter's cabin, slid up the platform, or ran against the west side of the platform, and tore up the side of the loop-line next to the platform, and portions of one of them were diverted from the platform towards the westward, and through the wall bounding the station premises; but not one of them escaped contact with the platform. It is true that the guard May, riding in break-van No. 8, the last vehicle but one, and certain of the passengers, were under the impression that they must have run for part of the way up the rails of the loop-line, and that the hindmost vehicles were off the rails for a very short distance only; and such an impression was a very natural one on their part. On the other hand their further evidence as to jolting and bumping, and as to the off-side buffer of the last carriage penetrating the van in front of it, is not consistent with that view; while there were other passengers, and in the last carriage of all, which, if any, would have been on the loop-line, whose evidence has a contrary tendency; and one of them in particular was confident, from the jolting, which, after the first lurch, he at once experienced, that his carriage was off the rails from the very first. But these vehicles were brought to a stand from a speed of, say 40 miles an hour, within a distance of 130 yards; and, indeed, the whole of the eight vehicles came to rest within 160 yards from the facing-points, or, as regards time, in about a quarter of a minute (16 seconds) after passing the facing-points. The recollections of persons placed under such circumstances, of their exact feelings during so short an interval of time and space, in regard to matters so unexpected, so suddenly occurring, and exciting so much apprehension at the instant, must not be implicitly relied on; and especially as they may have been subject to modification by subsequent impressions, or by reflections on what they saw, or felt, or as to what was likely to have occurred. Such evidence must command a certain amount of weight in connection with other indications, and with the material evidence; but it is very difficult for anyone to recollect or define the precise amount of irregular motion which he has experienced in such a case, and still more difficult to apply such evidence afterwards in determining the precise track which a vehicle may have followed after diverging from its proper course. As regards the 16th and 17th vehicles of the train, less need here be said, as their tracks are more easily defined than those of the following eight vehicles. The 16th vehicle was off the rails of the main line sufficiently far to strike with its near trailing axle-box the south-east corner of the passenger-platform; and the 17th vehicle, which had its near side torn out by striking against the shunter's cabin, and which impinged more violently against the south-east corner of the platform, was diverted or dragged to a still greater distance from the rails of the main line. But, as has been already stated, it is not probable that either of these vehicles was the first to leave the main line. They both remained on their wheels and afterwards returned to the main line on the north of the station. The great struggle which occurred between the portion of the train which went forward and the eight vehicles which were left behind, was evidenced in the fracture of the draw-bar of the 18th vehicle (the Caledonian carriage). This draw-bar was bent towards the off-side, and broken through the solid metal, behind the hook to which the coupling was attached, as the 17th vehicle (Conductor Harper's van) left it, with a tremendous wrench; and it would appear as if, after the 18th vehicle had first left the main line, it had caused, first the 17th, and afterwards the 16th, vehicle to leave the main line also. In order to account for the divergence of the 18th vehicle from the main line towards the loop-line, after a wheel had once mounted the near tongue of the points, it is by no means necessary to assume that the points were opened for the loop-line. When once the flange of a wheel of that or any other vehicle slipped, from any cause, over the off tongue, it might, in striking the heel of the tongue, readily fracture the inside jaws of the heel-chairs; it might, in running forward, mark the chairs at 29 and 32 feet from the ends of the points; and it would,—the corresponding off wheel having dropped on the inside of the off rail,—be diverted, by the off rail of the loop-line, which it would next meet with, towards the check-

rail which was displaced at 102 feet, and along the ballast between the rails of the loop-line. The collision with the displaced check-rail would, to some extent, determine its future direction, upon which again would depend the direction of the vehicles following behind it; and in this way those first marks, which are, as already stated, the most important indications of the origin and prime cause of the accident, may be most satisfactorily accounted for. Indeed, there is no other way of satisfactorily accounting for them. On this assumption, it is, however, necessary to believe that the check-rail at 80 feet from the points, and inside the near rail of the loop-line, was indented, not by a wheel of the first vehicle which left the rails, but by a wheel of some following vehicle, which may well have been the case.

The next points to be considered in connection with this part of the subject are the evidence of and in regard to the signalman in the junction-cabin,—his actions, his probable motives, and the working of his apparatus. This signalman gave his evidence in a truthful manner, and it turned out to be consistent with the statements of the signalman at the Canal Bridge cabin on the south of him, and with those of the signalman in the cabin on the north of the station, as well as with the entries in their record-books. He denies, not only having moved the lever, No. 7, of the facing-points, but also having turned his home-signal to danger before the accident occurred; and this denial is corroborated by the evidence of the signalman who was in the Canal-Bridge cabin. The latter signalman saw the train pass, was watching the home-signal at the junction-cabin, heard the noise of the accident, and asserts that the signal was not previously to that noise returned to danger. Such statements on the part of the signalman himself, and of a brother signalman, who sometimes takes relieving duty in the same cabin, are, of course, open to the imputation of being possibly made to screen a grievous mistake; but they must be taken for what they are worth; and there is no other evidence to confirm them or to rebut them, as to the position of the signal when the accident occurred. The signalman of the Canal-Bridge cabin was called unexpectedly from his cabin to give his evidence on the first day of the inquiry; and he stated that he had not had previously any communication with the junction signalman on the subject. If the statement is true, that the home-signal, after being lowered for the passage of the train, was not again moved until after the accident, then the signalman would have been mechanically prevented by his locking apparatus from altering the facing-points during the passage of the train, and could not by this means have caused the accident. There was a reason for his altering the facing-points, and setting them for the loop-line after the passage of the tourist train, inasmuch as he had received notice on his gong of the approach of what is termed the Staleybridge mail train, which ought, in the ordinary course, to have preceded the tourist train. But he had no object in doing so hurriedly or prematurely; and it would have been his duty, before setting his points for the loop-line, and lowering his signal for that line, to have asked the permission, which he does not appear to have done, of the north signalman, by moving the lever of a mechanical gong five times. Further, in order that the eight last vehicles of the train should have been turned into the loop-line, and should have run along the rails of the loop-line without leaving any indication of their having done so, it was necessary that the signalman should pull over another lever, No. 9, for working the points marked B in the diagram, and that lever is also interlocked with the main line home-signal. If he had not pulled that lever over, and had not altered those points, they would have been strained, or their connections with the cabin would have been strained, as the vehicles passed through them. As no indication of their having been so strained was discoverable, the signalman must, apparently, if those vehicles ran along the rails of the loop-line, after turning his home-signal to danger, have pulled over No. 9 as well as No. 7 lever in his cabin; and whilst it is a question whether the movement of the latter was possible whilst the train was passing at so high a speed, it is a further question whether the additional action of pulling over the former is conceivable. It is right to add that the evidence in favour of the signalman thus afforded, by the fact of No. 9 lever being interlocked with the signal-lever, was not brought forward or alluded to in any way by the signalman himself, but originated with the officer of the Company who superintends the construction of their locking apparatus. Whilst listening to the evidence in the case, the idea suddenly occurred to that officer that these two levers might probably be so interlocked. He went to the cabin and tested them, and he returned to include that statement in his subsequent examination.

The various reasons for believing that the junction signalman may have moved the facing-points, and the various difficulties that exist in the way of such a conclusion, and the difficulties in the way of believing that the accident is to be attributed to any obstruction in the points, or any action of the wheels upon the points, or the absence of cotters, or any other defect in the rods connecting the tongues of the points, having thus been stated, it becomes necessary to consider further, in what other mode, or by what other cause or causes, the accident could have been occasioned.

As regards the rolling stock, the greater number of the vehicles ran safely from London, and all ran safely from Warrington to the site of the accident. Several axles were found to be bent after the accident, including two under the Caledonian carriage, No. 123. The leading axle of that carriage was so much bent as to throw the wheels attached to it $2\frac{1}{2}$ inches out of gauge, and one axle amongst the débris was so much bent as to throw the wheels attached to it $5\frac{1}{2}$ inches out of gauge. But these defects may well have been the result of the accident, and there is no evidence of any axle having been bent previously to the accident. There was a play of about $\frac{3}{16}$ths of an inch of the axle-brasses on the journals of the axles of Conductor Harper's van, and a maximum play of about $\frac{3}{8}$ of an inch of the axle-brasses on the journals of the axles of the Caledonian composite-carriage. One plate in one of the springs of the Caledonian carriage was found to be fractured, and one of the axle-boxes of Conductor Harper's van was also found to be fractured after the accident; but the violence which the latter vehicle received, in striking, first against the shunter's cabin, and afterwards against the south-east corner of the passenger platform, is amply sufficient to account for such a fracture. Numerous other results of the accident were only too apparent. The brass door-handles, hinges, and accommodation-handles, as well as other projecting parts, had been ground away to a considerable extent as the carriages slid up the platform in some cases; and springs and other parts had been bent, damaged, or displaced, in other cases; and, indeed, fourteen waggons stood loaded at the Springs Branch junction, with broken roofs, sides, ends, and débris, and even broken framings of carriages. It would have been next to impossible in many cases to determine which parts belonged to the several carriages; and the attempt would not have been of much use. The Caledonian carriage, No. 123, was that to which it was desirable principally to direct attention, but after the extreme violence to which it had been subjected, it was hopeless to attempt to determine what might have been its precise condition in many respects prior to the accident. There was no fault to be found with the wheels; and the only remark that can properly be made in regard to the condition of the rolling stock is that there is no evidence of its having been otherwise than in good working order, though there must doubtless have been some inequalities in the heights of the buffers, in consequence of certain vehicles running with only a few passengers and less luggage, and others with heavier loads of luggage interposed

between them. As regards the height of the buffers and draw-bars, a singular difference was shown in the drawings of vehicles submitted by the carriage superintendents of the London and North-Western and Caledonian Railway Companies—purporting to represent vehicles in the train. The former gentleman furnished, in the first instance, two drawings, both showing 3 feet 4½ inches, and the latter gentleman one drawing, showing 3 feet 6 inches as the height from the rails to the centres of the buffers; and the extraordinary explanation was afforded in the former case that the drawings for these recently constructed vehicles had been under a mistake made upon an old standard given up many years previously, but that the vehicles were really constructed to the new standard of 3 feet 6 inches. The vehicles measured differently from each other, and differently at the two ends of each, after the accident; but it is impossible to ascertain now what variations there might have been in their heights as they were running with their various loads before the accident.

There was not the same difficulty as regarded the permanent way, which was said not to have been disturbed south of the facing-points, or at the facing-points, after the accident up to the time of the inquiry, with the exception that the fractured heel-chairs on the near side had been replaced by others. The permanent way is, as has been stated, of a most substantial character as regards the rails, chairs, and sleepers; but it was not in good adjustment. There were irregularities of gauge, line, and level in the neighbourhood of the facing-points, which would tend to cause oscillation in passing vehicles; and there was a bulge inside the off rail to the extent of $\frac{5}{16}$ths of an inch, between the off tongue of the facing-points and the off tongue of the leading-points 5 feet 9 inches on the south of them, in consequence of the standard-rail having been bent to receive the tongues of the points. The system of bending rails at the points is a common one, and is practised by other companies besides the London and North-Western Company; but certain other companies do not bend the rails for this purpose in this manner. Such a system requires to be applied in all cases with care and discretion, and it is certainly objectionable as applied in this particular case, in which every off wheel passing along the main line (which is straight) meets with what is practically a bulge of $\frac{5}{16}$ths of an inch inside of the off rail. The tendency of such a bulge might, if it were struck by an off wheel, be to throw the flange of the opposite near wheel of a vehicle over the near tongue of the points in advance; and, in fact, to produce an effect similar to that in which the present accident would appear to have originated. It is true that the points and the permanent way, remaining, apparently, in the same condition, have since been run over by other trains at high speed; and one of the same engine-drivers stated, on one day of the inquiry, that he had that morning passed through Wigan with the same train at higher speed than on the morning of the accident. It is also true that the bulge above referred to has been for two years subjected to the test of passing trains at all speeds without any previous bad result. But in cases in which the margin between danger and safety is small, much risk may be incurred on many occasions without an actual catastrophe. And the general condition of the permanent way, coupled, perhaps, with a little extra oscillation in the vehicles after leaving the curve of 30 chains radius on the south of the station, may, nevertheless, have been the cause, during an unfortunate lurch of one of them, of the present accident.

The case is one of great difficulty, but the verbal evidence, the material evidence, and the whole of the circumstances, taken together, appear to warrant the above arguments and conclusions. The absence of sufficient recorded tracks and wheel-marks renders it impossible to determine the precise routes of the ten vehicles which were thrown off the rails. But as regards the cause of the accident there would appear practically to be only two alternatives. Either the points were moved and the last eight vehicles of the train were turned by the signalman into the loop-line, or else, without the points having been moved, the flange of the near leading wheel of the Caledonian carriage, No. 123, slipped during its passage along the main line over their near tongue. The difficulties in the way of believing that the signalman moved the points, and turned the eight vehicles along the loop-line, including the questions of how those vehicles could in such a case have reached the positions they subsequently occupied, and how the first indications on the permanent way could have been produced, have been explained at length, and on the evidence are insuperable. The mode in which the accident may have occurred from the other cause stated has also been explained, and it seems on the whole, to be a conclusion that it is impossible to avoid.

The conditions in the present case were as follows: —A train of maximum length, drawn by two engines, after passing round a curve of 30 chains radius,—on leaving which there would be a certain amount of oscillation in the carriages—ran at, say 40 miles an hour, along 60 yards of straight line, over a portion of permanent way on which the traffic and shunting were almost incessant, and a high condition of maintenance was not preserved, through leading-points and facing-points within 5 feet 9 inches of each other, with a bent rail between them to receive the tongues of the points,* and past a signal-cabin the locking apparatus in which had in the course of six years of wear and tear become impaired in usefulness, and was in need of repair.

Under these conditions, the flange of the near leading wheel of the 18th vehicle slipped over the near tongue of the facing-points, fractured the heel-chairs, and marked the chairs further forward, while the corresponding off wheel dropped inside the off rail of the main line. The leading wheels of the carriage which thus left the main line were diverted from their course by the off rail of the loop-line, and further by the contact of the near leading wheel with a check-rail. The carriages in front of it were drawn off, and those behind it dragged off, the main line as the train proceeded forward. Meeting with other obstacles, these various vehicles ran against the shunter's cabin, and up the platform, or against the platform, and finally came to rest in the positions in which they were found. And all this happened, apparently, without the points having been moved, either by the action of the pointsman, or by the effect of the wheels of the train, or from any other cause.

It is true that a greater degree of safety may be obtained now than formerly in running through facing-points, in consequence of the introduction of locking-apparatus in the cabins and locking-bars at the points; but it is not wise to presume too much upon these aids to security. There always remains the liability at points and crossings of a check-rail out of gauge, or of the heel of a point being low, or of other want of adjustment. They never can be made quite as safe for trains at high rates of speed as those portions of line on which they do not exist. More or less of risk may constantly be incurred without an accident or an actual disaster, but all safety on railways depends on the reduction of risk so as to obtain a proper margin of safety. The moral of this accident is, in our opinion, obvious. The speed of such trains should be materially slackened in passing through a station at which the above condition of affairs exists; and it becomes incumbent upon us to lay the greater stress upon the necessity for such a precaution, because it is on the evidence that the regular engine-driver of the tourist train has run through Wigan at higher speed since the accident than on the night of the accident, and because a high authority, who has appeared on behalf of the Company, has expressed before us a deliberate opinion that a speed of 50* miles an hour is now reasonable

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* See Note (A) at end of Report.

and proper, and consistent with the printed regulation No. 212 of the Company, in passing through the Wigan station. We do not desire to object in any way to such a speed, or to a higher speed, on portions of the line which are well adapted to it, but we do consider that in all cases in which the highest speeds are employed the highest conditions of security in construction and maintenance should also be provided.

The circumstances have also been referred to in the course of the inquiry, under which the rival railway companies competing for passenger traffic between England and Scotland, have from time to time accelerated the speed of their trains; and it has been alleged that they have received encouragement from the public to do so. Indeed, Mr. Cawkwell, the managing director of the London and North-Western Railway, attributes the fact of the bulk of the passenger traffic between London and Edinburgh being carried by the East Coast route to the circumstance that a shorter time is occupied on the journey by that route than by the West Coast route, and states that between London and Perth, the time being the same, the traffic is carried in preference by the West Coast route. It is, of course, to the advantage of the public that this competition has existed, and that they have as a result received increased accommodation and been conveyed in faster trains, and at less expense, than might have been the case if one line of communication only had existed. But there may be a point at which it is desirable, in the interest of safety, that the ardour of competing companies should be moderated. The acceleration of the mail and passenger service has been accomplished from time to time, partly by increased speed in running, and partly by a reduction in the number of stoppages. The latter principle is unexceptionable, so long as excessive speed, according to circumstances, is not employed through the stations at which the trains are no longer brought to a stand. The former principle may be extended beyond the limit of reasonable safety, and especially in cases in which the engine-drivers, in order to obey their working time-tables, are compelled to keep up their speed on the more dangerous parts of their journeys. The public have no other means of judging when that limit is exceeded than are afforded them by experience; and, indeed, it has only been ascertained by the practice of working in a series of years, that railway trains are capable of being run at the high speeds which are now with so much safety employed. The question, then, naturally arises, with reference to the present catastrophe, whether the limit referred to as regards safety is now exceeded;—whether the time-tables are not so arranged, that engine-drivers are compelled, in order to conform to them, to run through Wigan and other places at such speeds as may be considered to cause undue risk to passengers; and whether it is desirable, in the interests of public safety, that any attempt should be made to induce the competing companies somewhat to moderate their speed. There is an old principle of common law,* under which, in the case of two coaches racing the one against the other and an accident occurring to anyone, the two drivers were held both of them to be equally amenable to a charge of manslaughter. Circumstances have materially changed since the introduction of railways instead of coaches for the conveyance of passengers. Railway trains, running on the lines of different companies, cannot come into collision with one another, or directly cause risk to one another, as could the coaches running along the same road in former times; and lines of railway are the property of companies, and are not public highways. But other risks, of a more serious character, are incurred on railways, in the event of failures or defects in the permanent way or the rolling stock, and especially when very heavy trains, without an adequate proportion of break-power, are run through dangerous places at excessive speed; and the lives and limbs of the public may be seriously endangered in such cases from causes entirely beyond their cognizance or control. Following out the above principle (of common law) it becomes a question, therefore, whether in the case of two or three competing railway companies blame may not properly attach, not only to the company on whose line an accident occurs, but also to a company incurring similar risks, and engaged in competition to a dangerous extent. According to the evidence of Mr. Findlay, it would appear that at a conference at the Railway Clearing House, of the railway managers concerned in the question, a specific resolution was moved on behalf of one company, with a view to more time being allowed for the running of through trains on their long journeys; but that it was objected to on behalf of other companies who preferred higher rates of speed; and no agreement on the subject was therefore concluded. The engine-drivers are, in practice, tempted, if not compelled, in conforming to the working time-tables with which they are provided, to run through Wigan and other places, at speeds which are not apparently consistent with a reasonable degree of safety; and the printed regulation, No. 212, so much referred to, enforcing "great caution" upon them, is stated to give them only a discretion which they are thus in a great measure prohibited from exercising. The practical limit of speed with existing appliances has now almost been reached. On portions of railway maintained in high condition, and adapted to the purpose, there appears, if uniform rolling stock, well found and fitted in all respects, be employed, to be very little extra risk up to the highest speeds attainable; but on other portions, through important stations, in which goods traffic and shunting are carried on to a great extent, and where there are numerous points and crossings, including facing-points, it is not in our opinion desirable, even when the best appliances are provided, that trains should run through without very material diminution of speed; and we cannot but consider, having in view the circumstances of the present accident, that there is grave responsibility attaching to the company on whose line it has occurred, and also to the other companies actively competing with it, unless they adopt reasonable precautions, not only in prescribing that moderate speed should be habitually employed in passing through stations, junctions, and places where extra risk is incurred, but also in taking care that under proper discipline their regulations to this effect are carried out in practice.

I have, &c.,
H. W. Tyler.

I entirely concur in the above report.

W. W. Ravenhill,
Legal Assessor.

The Secretary,
(Railway Department),
Board of Trade.

Note (A.)

Mr. Findlay, the Assistant General Manager of the London and North-Western Railway, having considered that the spirit of his evidence has not been correctly referred to in this expression to the jury at Wigan, it appears only fair to him to allow him to give his own explanation in regard to it, in the following letter, and to append an extract from his evidence as taken down by the short-hand writer employed for the purpose.

North-Western Hotel,
Liverpool, 16th September, 1873.

Dear Captain Tyler,

I am much obliged by your letter, and the extracts from the short-hand writer's notes of my evidence at Wigan.

* Vide R. V. Swindall, 2 C. and K., p. 233.—Lord Chief Baron Pollock, ruling in favour of Mr. Greaves, Counsel for the Crown; and see also Russell's Crimes and Misdemeanors, by C. S. Greaves, Esqre., vol. 1, p. 870.

59. Whale, Geo., L. and N. W., assistant locomotive superintendent.

8 witnesses called, and
5 witnesses recalled.

FIFTH DAY.

Tuesday, 19th August.

40. Thompson, William, a passenger.
41. Dod, Rev. C. Woolley, a passenger.
42. Chadwick, Jno., foreman, foundry near station.
Taberner, Jno., station-master, recalled.
Stawpert, Wm., engine-driver, tourist train, recalled.
Connor, Ben., of the Caledonian Ry., recalled.
Taberner, Jno., recalled.
43. Loveday, Hy. Herbert, inspector Midland Ry.
Tootill, R., platelayer, recalled.
Edwards, Mr., late of Saxby and Farmer, recalled.
Burrows, Jas., C.E., recalled.
44. Wark, Andrew, a passenger,
Connor, Benjamin, recalled.
Edwards, Mr., recalled.
Taberner, Jno., recalled.
45. Parker, Gustavus, signal inspector.

6 witnesses called, and
10 witnesses recalled.

SIXTH DAY.

Thursday, 28th August.

46. Bore, Rich., L. & N.W., carriage superintendent.
47. Rigg, Jno., L. & N.W., outdoor locomotive superintendent.
48. Naylor, David, driver of limited mail.
49. Ivatt, H. A., fireman of limited mail.
Stawpert, Wm., driver, tourist train, recalled.
50. Pigott, A., signal inspector, G.N.R.
Bore, R., recalled.
51. Forsyth, Hy. Arthur, passenger in last carriage.
Harper, Alex., conductor, recalled.
Lambert, Jno., guard, recalled.
May, Fred., head-guard, recalled.
Rigg, Jno., outdoor locomotive superintendent, recalled.
Ivatt, H. A., fireman, limited mail, recalled.
52. Shaw, Mr., district superintendent, L. and N. W.
53. Bell, Thos. B., head-guard, limited mail.
54. Armstrong, Jno., under-guard, limited mail.
Thirwell, I., driver, leading engine, recalled.
55. Hyatt, Jno., station-master, Stafford.
56. Shepherd, A., carriage examiner, Stafford.
57. Tyler, Jno., shackler, Stafford.
58. Atkinson, Geo., platform inspector, Stafford.
59. Ellis, Jas., platform inspector, Crewe.
60. Cox, Ezra, porter, Crewe.
61. Williams, George, porter, Crewe.
62. Johnson, Wm., carriage examiner, Crewe.
63. Radcliffe, Thos., inspector at Warrington.
64. Walton, James, porter at Warrington.
65. Spice, Jacob, porter at Warrington.
66. Peach, Geo., porter at Warrington.
Tomline, F., carriage department, Crewe, recalled.

21 witnesses called, and
9 witnesses recalled.

SEVENTH DAY.

Friday, 29th August.

Dingley, Geo., locomotive foreman, Spring Branch recalled.
67. Preston, Robt., ex-postal messenger, Wigan.
Tomline, Mr., recalled.
68. Bolton, Geo., carriage greaser, Stafford.
69. Turner, Wm., carriage greaser, Stafford.
70 Malone, Ed., carriage greaser, Crewe.
71. Foster, Robt., landlord, Mitre Inn, Wigan.
72. Collier, Thos., tailor and draper, Wigan.
Preston, Robert, recalled.
73. Martlew, Catherine, Millgate, Wigan.
74. Foster, Wm., son of landlord, Mitre Inn, Wigan.
75. Preston, Frances, mother of Robt. Preston.
76. Wall, Thos. J. P., Postmaster, Wigan.
77. Clement, Richd., post office night mail messenger.
78. Gaskell, Hy., post office night mail messenger.
79. Cocker, Joseph, post office night mail messenger.
80. Watkin, Mr. W. J. L., colliery manager, Pemberton, Wigan.
81. Betley, Mr. R., public analyst, Wigan.
Price, Jno., night inspector, L. and N. W., Wigan, recalled.
Collins, Jno., porter, L. and N. W., Wigan, recalled.
Wilkes, Hy., porter, L. and N. W., Wigan, recalled.
82. Major, Jno., ex-post office night mail messenger.
83. Mason, Wm., ex-signalman, Jockey Lane, Warrington.
84. Heyes, Jno., signalman, Winwick Gatt, Warrington.
85. Sanker, Jno., signalman, Winwick Junction, Warrington.
86. Radcliffe, Robt., signalman, Golborne junction.
87. Leigh, Ed., ex-pointsman, Golborne station.
88. Lord, Joseph, ex-pointsman, Strangeways Hall.
89. Hart, Jno., signalman, Spring Branch.
Tomline, F., recalled.

23 witnesses called, and
7 witnesses recalled.

EIGHTH DAY.

Monday, 8th September.

90. Williams, Hugh, C.E., Wigan.
91. Wallace, J. C., Manchester, a passenger.
92. Brown, Jno., C.E., Sutton, Surrey, a passenger.
93. Harrison, Thos. E., 12, Quay Street, Manchester, a passenger.
Harper, Alex., conductor, recalled.
94. Evans, Thos., booking clerk, Wigan station.
95. Livesey, F., telegraph clerk, Wigan station.
96. Roberts, Geo., guard, Staleybridge mail.
97. Findlay, Geo., assistant to managing director.
98. Steward, Jno., surgeon, Wigan.
Burrows, Jas., C.E., recalled.
Brown, Jno., C.E., recalled.
99. Podmore, Ben., driver of Staleybridge mail.
100. Carter, W. H., of New York, a passenger.
101. Tong, Jas., colliery viewer, Westhoughton.
Radcliffe, Thos., inspector, Warrington, recalled.
Burrows, James, C.E., recalled.
Houghton, Jno., inspector permanent way, recalled.

12 witnesses called, and
6 witnesses recalled.

NINTH DAY.

Tuesday, 9th September.

102. Whalley, Wm., driver, Warrington bank engine.
103. Dooley, David, fireman, Warrington bank engine.
May, Fred., head-guard, recalled.
104. Cawkwell, Mr., general manager, L. & N.W. Ry.

3 witnesses called, and
1 witness recalled.

Plate N° 1

To accompany Captain Tyler's Report
Dated 12th September 1873.

LOOP LINE

Brok

GS.

N MAIN LINE to Carlisle

P MAIN LINE.

r Mark

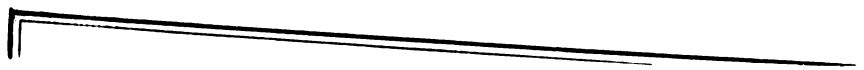
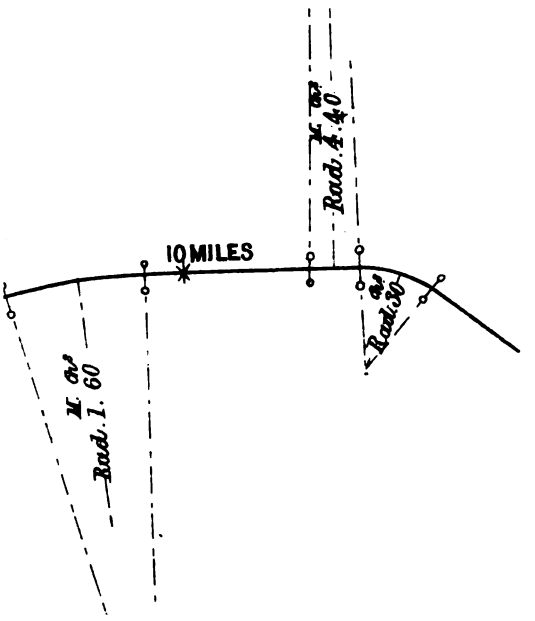
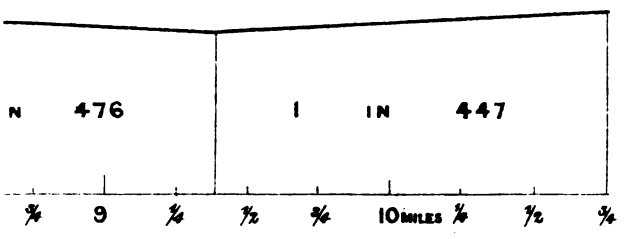


Plate Nº 2.

To accompany Captain Tyler's Report,
dated 12th September, 1873.





Vincent Brooks, Day & Son Lith.

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Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE,
DATED THE 26TH AUGUST 1873,

INTO THE CIRCUMSTANCES ATTENDING THE COLLISION ON THE

GREAT NORTHERN RAILWAY

WHICH OCCURRED AT

RETFORD

On the 23rd August 1873.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

[C.—934.—I.] *Price* 1*d.* 1874.

THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE, DATED THE 26TH AUGUST, INTO THE CIRCUMSTANCES ATTENDING THE

Collision on the Great Northern Railway, which occurred at Retford on the 23rd August 1873.

Board of Trade,
(Railway Department),
16th September 1873.

SIR,

IN compliance with the appointment dated 26th ultimo, I have the honour to lay before you, for the information of the Board of Trade, the report of the public inquiry held under the Railways Regulation Amendment Act, 1871, by myself and Mr. Ravenhill, barrister-at-law, into the circumstances which attended the collision that occurred on the 23rd ultimo, at Retford station of the Great Northern Railway, by which three passengers were killed, and between thirty and forty were injured.

The mayor of Retford kindly placed the Borough Court House of that town at our disposal for the purpose of conducting the investigation.

The inquiry commenced on the 27th August, was resumed the 6th of September, and was concluded in London on the 15th inst.; and a number of witnesses were examined, the minutes of whose evidence are sent herewith.

We also attended the coroner's inquest held on the 5th September, on the persons killed by the accident, and had the advantage of hearing the evidence taken by him.

On our arrival at Retford we carefully inspected the station and its approaches, the level crossing on which the accident occurred, the junctions, and all the signal arrangements connected with the station, and the several lines running through it.

Retford station has an up-and-down platform for the two lines of rails that run north and south. There are station buildings on each platform, which are used by the Great Northern, and the Manchester, Sheffield, and Lincolnshire Railway Companies.

The Great Northern railway from York to London crosses on the level, at an angle of 60°, the Manchester, Sheffield, and Lincolnshire railway, from Sheffield to Lincoln. This crossing, which was the place where the accident occurred, is at the south end of Retford station.

There is a junction line between the Manchester, Sheffield, and Lincolnshire Railway and the Great Northern railway at the north end of this station, by which the Manchester, Sheffield, and Lincolnshire Railway Company's trains are run up to Retford station platform, with the object of depositing passengers at Retford or of transferring those passengers to the Great Northern trains. There is also a junction line between these two railways at the south end of the station, for similar purposes. The junction line at the north end of the station is crossed on the level by another line of rails, and two siding lines, which belong to the Great Northern Company.

The crossing on the level at the south end of the station where the accident happened was not specially referred to in the Acts of Parliament of the two companies which were obtained in the year 1846. Several other level crossings of railways and public roads were referred to in those Acts, but the only provision which authorised the crossing at the south end of Retford station, was the clause which provided for both these railways being constructed in accordance with the parliamentary plans attached to the Acts. These plans showed the level of the railways to be within eight feet of each other at the point of crossing; and the Railway Clauses Act, 8th Vict. chap. 20. sec. 11. permits railway companies to deviate vertically to the extent of five feet from the line shown in the parliamentary plans. Under the provisions of these Acts of Parliament, the two railways were constructed so as to cross each other on the level. The junction line between the two railways at the south end of the station was sanctioned by the same Act of Parliament, and the junction line at the north end of the station was sanctioned by Act of Parliament dated 24th of July 1851.

The line and the two sidings of the Great Northern railway at the west side of Retford station existed at the time that the construction of the junction line at the north end of the station was sanctioned.

It appears, therefore, that these several crossings and junction lines, as they now exist, were duly authorised and constructed under the authority of Parliament. When the railways were completed they were inspected by the Board of Trade officers. The signal arrangements are such, as were universally in use and approved of at that time, and the Board of Trade's sanction for the opening of the lines was given in due course.

The Act of Parliament, dated 26th of June 1846, further provided, that the regulations for working the several level-crossings referred to or authorised by the Act, should be arranged by the officers of the respective railway companies, and that in case of differences arising between those officers, the determination of the matters in dispute should be referred to the Board of Trade. No differences did arise between the officers of the two companies, and there was no reference to the Board of Trade.

It was arranged to provide home-signals as well as distant signals at all sides of the level-crossing at the south end of the station; but by subsequent arrangements entered into between the officers of the two companies, it was deemed expedient to do away with the distant-signal at the north side of the crossing. As it was provided that all trains coming from the north should stop at Retford station, it was thought that a distant-signal at the north side of the crossing would interfere with the convenient working of the station, and that the distant and home signals which were erected for the protection of the north side of the station would be sufficient, the crossing being protected by a home-signal, and by the rule, that all trains coming from the north should stop north of the crossing at Retford station.

On the 6th of June 1861 the following regulation was issued for the guidance of the signalman stationed in what is called "the tower signal-cabin" at Retford, from whence the station-signals are worked :—

"Before the Great Northern signalman lowers his tower-signal to allow an up train to proceed over the crossing of the two railways, he will ring a bell to the Manchester, Sheffield, and Lincolnshire signalman at the crossing, to intimate that a train is waiting to cross; and he will keep his tower-signal up, until the Manchester, Sheffield, and Lincolnshire crossing signalman has lowered his signal to allow the train to approach."

It appears that this rule was only intended to apply to the working of the signals, for trains that had already entered and come to a stand at Retford station platform.

The tower-signal and the distant-signal at the north side of the station have always been lowered for trains to enter when the station is clear; the station-signals were then placed at "danger;" and a train has not been allowed to proceed on its journey southwards over the crossing, until both the tower-signal and the crossing-signal were lowered.

The cabin from which the crossing-signals were worked, was at the south-east corner of the crossing, about 80 yards from the tower.

It appeared from the evidence at the inquiry, that special trains of horses from the north were occasionally run through Retford station without stopping ; and the Great Northern Railway Company now run an express train from London to Edinburgh, and from Edinburgh to London, through Retford, without stopping at that station. This train is known as the "*Flying Scotchman.*" It leaves London at 10 a.m., and Edinburgh at 10.25 a.m. Intimation was always conveyed to the signalman of the running of these express trains, and also of such special horse trains as were not to stop at Retford station, and in these cases the Retford station-signal at the tower, as well as the up distant-signal at the north side of the station, were not lowered, until the signalman in the tower had obtained permission from the man at the crossing-cabin, and the latter had lowered his crossing-signal.

The Retford up distant-signal, which is worked from the tower, is about a thousand yards north of the station, and can be well seen by a driver approaching from the north long before he reaches it. The tower-signal at the station can be seen distinctly all the way from the distant-signal to the station ; and the up-signal at the crossing can be distinctly seen by an engine-driver of an up Great Northern train for a distance of about 900 yards before he reaches it. This crossing-signal remains distinctly in view during the whole time the engine-driver is approaching the crossing, except for about 50 yards, when, for a period of about five seconds, it is partly hidden by the gable of a goods store. The approach to the station from the north is practically level.

On the day in question the Great Northern train from Edinburgh to London was divided into two parts at York, as the train was considered too long. The front portion, which consisted of an engine and tender, and seventeen coaches under the charge of two guards, left York at 4.50 a.m.

It was 30 minutes late in starting. Eight waggons of fish and a break-van, were detached from the train in order to be sent on by another engine. The first part of this train reached London safely. The second part, which consisted of the fish waggons, left York at 5.25 a.m. and arrived at Doncaster about 7.2 a.m.

A goods train engine, of which George Bryant was the driver, and which had been intended to go from Doncaster to Grantham for a goods train, was detained at Doncaster to take on the fish train, which left Doncaster about 7.10 a.m.

This train reached Retford about 7.38 a.m., having run the distance of 17 miles in about 28 minutes, at a speed of about forty miles an hour. The Retford up distant-signal was at "*all right*" as the fish train passsed it. The engine driver shut off steam before he reached the distant-signal, and allowed his train to run on towards Retford station.

The Retford station-signal at the tower, which only works to "*caution*" and "*danger,*" stood at "*caution,*" denoting thereby that the station was clear.

The level-crossing signal stood at "*danger.*" The driver of the fish train ran up to Retford station platform at a speed which was estimated by an inspector, a carriage examiner, a night foreman of porters, and the signalman who is statioued at the north end of the down platform, as 15 to 20 miles an hour.

The inspector, who was in the goods yard about 400 yards to the north of the crossing, signalled with his hand to the engine-driver and guard of the fish train to check the speed of the train and proceed cautiously. The guard commenced to apply his break when he passed the inspector, but the engine-driver took no notice of the inspector's hand-signal, and he did not appear to notice the semaphore at the crossing, which stood at "*danger,*" until his engine got about half-way through the station.

The fireman stated that he was on the front part of the engine, engaged in oiling the machinery, during the time that the fish train was running from the distant-signal to the station, and that he was not aware that the crossing signal was at "*danger*" until he went back to the foot plate of the engine. The train had got about half-way through the station when the fireman went back to the foot plate. The engine-driver at this time gave a short whistle, reversed, and applied steam, and the fireman immediately put on the tender break ; but the speed of the fish train was only reduced to about 10 miles an hour, when the engine ran into a Manchester, Sheffield, and Lincolnshire excursion train, which was passing over the level-crossing at the south end of Retford station, and which contained about 300 passengers.

The crossing signals had been lowered to "*all right*" for the excursion train to pass.

The engine of the excursion train reached the crossing when the fish train was about 50 yards from it. The excursion train was running at a speed of about 10 miles an hour. The driver, on seeing the fish train, applied steam to try and pull his train across, but he failed to do so before the engine of the fish train ran into the excursion train. This engine caught the back end of the fifth carriage and the front end of the sixth carriage. Both these carriages and four other carriages of the excursion train were thrown off the rails and much damaged. The engine of the fish train was also thrown off the rails, and driven against the crossing-signal cabin, which it knocked down. The signalman in this cabin fell on the top of the engine, but escaped without much injury. Three fish trucks were thrown off the rails and were damaged. The fifth carriage of the excursion train, which was struck by the engine of the fish train, was also driven against the signal-cabin, and three passengers in this carriage were killed.

The signalman on duty at the north end of the station ought to have shown a red flag to the engine-driver of the fish train ; but he stated, that although the fish train was running fast, he thought that the train would stop at the station, as he had seen other trains stop, that had been running as fast or even faster.

The signalman in the tower-cabin, when he saw the fish train approaching at such speed, and that the excursion train was close to the crossing, hesitated whether he should divert the fish train through the junction opposite to his cabin, on to the Manchester, Sheffield, and Lincolnshire Railway ; but he was afraid that by doing so, he might cause a worse collision when the trains met sideways, than by allowing the fish train to run through the excursion train. While thinking whether he would divert the fish train, he forgot to throw up all his signals to "*danger,*" which he should have done. He could have done no harm by this act, and he might have attracted the attention of the driver of the fish train ; but probably both trains were too near the crossing at the time for it to have been of any use.

The view from the Manchester, Sheffield, and Lincolnshire Railway of a train approaching the crossing on the Great Northern Railway is obstructed by the station buildings. The gradient of the Manchester, Sheffield, and Lincolnshire Railway at the west side of the crossing is 1 in 146, falling eastwards. At the east side it is level for a distance of about 280 yards, and then falls eastwards.

The gradient of the Great Northern Railway at the north side of the crossing is 1 in 1,635, rising towards Doncaster, and the gradient at the south side is 1 in 1,348, falling towards Newark.

There would be no difficulty in passing the Great Northern Railway over the Manchester, Sheffield, and Lincolnshire Railway by making a deviation to the west of the present line, or in passing the Great Northern under the Manchester, Sheffield, and

Lincolnshire, by making a deviation to the east of the present line.

The Manchester, Sheffield, and Lincolnshire Railway would have to be raised or depressed to assist the work, and a new station would have to be built.

The station requires to be re-arranged, thoroughly re-signalled, and all points and signals should be interlocked.

So long as the level crossings exist, they should be protected by distant-signals on all sides, as well as crossing-signals; and no train should be allowed to run up to Retford station, from the north or from the south, while the signals are lowered for trains proceeding from the east or west over the crossing, and vice versâ.

Although trains from the north may be timed to stop at Retford, it is possible for them, when running up to the station, to overrun the tower signal, and then run into any train that may be on the crossing.

Trains have been known to over-run, but fortunately this does not appear hitherto to have occurred, while trains have been on the crossing.

It cannot be safe under any circumstances to allow trains to run with signals at "*all right*," to within 80 yards of another train crossing at right angles, as has been the case at Retford, and more particularly so on the Great Northern Railway, where trains travel at a great speed, and where the traffic is continually increasing. Vide Returns herewith.

It was stated at the inquiry that only one other accident has occurred on the level crossing, which is the site of the late accident, during the 21 years that it has been in existence. The former accident was caused by careless shunting.

Two other accidents have occurred on the level crossing of the junction line at the north side of the station. One of these was caused by the engine-driver of a Manchester, Sheffield, and Lincolnshire train being drunk, and over-running the signals, which were at "*danger*." The second accident occurred when a passenger train which was standing at the west side of the down platform was starting north. It was run into by a Manchester, Sheffield, and Lincolnshire train from Sheffield.

The very great freedom from accidents at a busy station like Retford, where there are three junctions and two crossings on the level, of railways nearly at right angles to each other, and where some 900 trains pass during the week, is most satisfactory evidence of the very efficient manner in which the duties of the station have been performed up to the present time.

The accident on the 23rd ultimo appears to have been caused by most unaccountable conduct on the part of the driver of the fish train. This man has been seven and a half years an engine-driver on the Great Northern Railway, and has hitherto borne an excellent character.

He was well acquainted with the road, and, according to the evidence given, appears always to have stopped at Retford on previous up journeys.

Although the absence of an up distant-signal to protect the crossing at the north side of the station, was calculated to mislead an engine-driver who was not acquainted with the road and the station, the crossing-signal, as already mentioned, could be seen distinctly by a driver of a Great Northern up train for 900 yards before he reached it, and in ample time for him to stop his train.

There can be no doubt, from the whole of the evidence, that this signal stood at "*danger*," and could be distinctly seen by the engine-driver of the fish train if he had been looking out for it. But this man does not appear to have seen it until he got half-way through the station, and was within about 130 yards of the crossing.

Had he seen the "*caution*" signal given to him by the inspector when the fish train was approaching the goods shed, he might easily have pulled up before his train reached the crossing; but he does not appear to have become aware of his danger, until the fireman returned on to the foot-plate from oiling his engine.

The regulations of the Great Northern Railway company, the receipt of which the engine-driver had acknowledged by his signature dated 24th November 1856, provide that engine-drivers and firemen should keep a good look out when approaching or running through stations. Oiling the engines should be postponed to a more favourable opportunity. But this rule, which is essential to safe working, was not attended to. The fireman was taking advantage of the time when steam was shut off, in approaching the station, to oil the cylinders of the engine.

The firemen as well as the engine-drivers are bound by the regulations of the company to keep a good look out for signals at the station and level-crossings, but the fireman must in all cases act under the direction of the engine-driver.

The guard of the fish train does not appear to have been as much on the alert as he should have been. He did not apply his break until he saw the station inspector waving his hand to caution him.

Blame does not appear to attach to the signalmen at the north end of the station and at the tower-cabin for not having shown "*danger*" signals.

These men were ready to perform their duty, but they were taken by surprise, and at first believed that the fish train, which was a short light train, would stop at the station, and then they became too confused to act.

The engine-driver of the fish train was committed by the coroner to stand his trial for manslaughter, and he was advised by his solicitors not to make any statement.

He did not attend the inquiry.

See correspondence sent herewith.

The fireman, who had been also given in charge, was present, and after being duly cautioned gave his evidence.

I have, &c.,
F. H. Rich,
Col., R.E.

I entirely concur in the above report.
Wm. W. Ravenhill,
Barrister-at-Law.

The Secretary,
(Railway Department),
Board of Trade.

Great Northern Company's Trains.—Retford

A Week's Traffic.

	Down Passenger.	Down Goods, &c.	Up Passenger.	Up Goods, &c.
1853.				
August -	48	132	54	132
1873.				
May - -	90	174	89	120
Increase -	42	62	35	—
Decrease -	—	—	—	12

N.B.—The decrease is caused by the goods traffic being turned over the new loop line viâ Lincoln.

Manchester, Sheffield, and Lincolnshire Trains.—Retford.

	Up	Down
Gross increase in May 1873 over May 1863 -	92	89
Gross increase in December 1872 over December 1863 - - - - -	92	89

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Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE,
DATED THE 4TH OCTOBER 1873,

INTO THE CIRCUMSTANCES ATTENDING THE COLLISION ON THE

CALEDONIAN RAILWAY

AT

McANDREW'S SIDING NEAR THE MOTHERWELL JUNCTION,

On the 30th September 1873.

Presented to both Houses of Parliament by Command of Her Majesty.

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Collision on the Caledonian Railway, at McAndrew's Siding near the Motherwell Junction, on the 30th September 1873.

SIR, *30th October* 1873.

IN compliance with the instructions contained in your minute of the 4th instant, I have the honour to submit, for the information of the Board of Trade, the report of the Court of Public Inquiry into the circumstances which attended the collision that occurred on the 30th September at McAndrew's siding, near the Motherwell Junction, on the Caledonian Railway.

This Court of Inquiry was held first at Wishaw, and afterwards at Glasgow, with the assistance of Mr. W. W. Ravenhill, barrister-at-law, as legal assessor; and 33 witnesses were examined. The sitting commenced on the morning of Saturday, October the 11th, and lasted till 8 o'clock that evening; and it was resumed on Monday the 13th, at 9 a.m., and concluded that afternoon.

The circumstances were, briefly, as follows:—The tourist train, 8 p.m. from Euston station, London, and 3.55 a.m. from Carlisle, consisting of an engine and tender, six passenger-carriages, and three break-vans, had passed the Wishaw station, and on reaching a point about 60 yards beyond the signal-cabin near McAndrew's siding, came into collision with a mineral break-van which was in its way on the down main line. The fireman of the passenger train was killed on the spot, and the engine-driver was much injured. Only one passenger has complained of injury.

General Description.

The signal-cabin for the siding known as Mc Andrew's siding is a mile and a half from Wishaw, and rather less than a mile and a quarter from Motherwell. The main line to the south of the cabin is straight for about two and a half miles, and a large portion of it is on a falling gradient, from the direction of Wishaw and Carlisle, of 1 in 137. The main line is also straight for a mile and a quarter to the north of the cabin. Opposite to it, there is a cross-over road between the two main lines, of which the points are worked from the ground by levers close to them. Sixty yards north of the signal-cabin there are a pair of leading-points connected with the sidings used by Mr. McAndrew for his Shields Colliery. There are two sidings parallel to the main lines, and a number of other sidings running directly into the colliery; but they are all connected with the down main line by means of the leading-points above referred to. There are safety-points and a chock-block on the sidings parallel to the main line, and there is a chock-block on the sidings, which are on the level, running into the colliery.

There are no home-signals at the cabin, but there is a distant-signal in each direction, the distant-signal towards Wishaw and Carlisle being 799 yards from the signal-cabin, and the distant-signal towards Glasgow being 550 yards from the signal-cabin. There is no apparatus in the cabin, excepting a clock and a single-needle telegraph speaking-instrument, to communicate with the following stations:—Lesmahagow, Motherwell, McAndrew's cabin, Shieldsmuir, Wishaw, Pather, Garrion Gill, Craigenhill, and Carstairs. There is also a telegraph-bell communicating with the Windmill Hill cabin, about 1,100 yards on the north of McAndrew's cabin. This bell is intended to protect shunting operations at the Flemington Hill siding, which is between the Windmill Hill cabin and the McAndrew's cabin, and about 600 yards from the latter; and also the shunting operations at Windmill Hill, by means of the signal worked from Mc Andrew's cabin. The distant-signal from the Flemington Hill siding, which is between the Windmill Hill cabin and the McAndrew's cabin, not being sufficient for the protection of the shunting operations at Flemington, the distant-signal from the McAndrew's cabin is kept at danger also while trains are shunting at that place; and the notice as to the distant-signal being required for that purpose is given by means of the telegraph-bell referred to. About 829 yards on the south of McAndrew's cabin, there is another cabin, called the Shieldsmuir cabin; but there is no means of communication between these two cabins.

The Shieldsmuir cabin is a more important one. There are colliery junctions on the east and on the west of the main lines connecting them with the East Shieldsmuir and West Shieldsmuir collieries. There are also sidings on both sides of the main lines; and, indeed, the sidings previously referred to as being parallel to the main lines, and joining them on the north of the McAndrew's cabin, run through as loop lines, and join the main lines again near the Shieldsmuir cabin. This cabin is provided with 15 levers for working points and signals, and with locking-apparatus by Messrs. Stephen and Son, as well as with two single-needle telegraph-instruments, and with two telegraph-bells,—the one communicating with the Pather cabin, and the other communicating with the south cabin at Motherwell; and a record-book is kept in it of the passage of all trains.

The Evidence.

In presenting a summary of the evidence it will be convenient to commence with that of the engine-driver, the conductor, and the guards of the tourist train. The fireman, it will be remembered, was killed.

John Boyd, the engine-driver, said he had been 19 years in that capacity in the service of the Caledonian Company, and had driven fast trains for the last two years. He was driving the tourist train on the morning of the 30th of Sepember. They left Carlisle at 4.17 a.m., and Carstairs about 6, by his watch. Nothing unusual happened till they reached the neighbourhood of the accident. They were going down the incline, with the steam off, at their usual speed, which would be from 35 to 40 miles an hour. The signals were all clear for them to proceed. He noticed that at McAndrew's siding, $\frac{3}{4}$ of a mile off, the arm of the distant-signal was about 15 degrees up—much below caution; this meant "clear." Sometimes when at "clear" that arm was within the post; at other times it was a little up, as on that occasion. If it had been as much as 45 degrees (the ordinary caution signal) up, he would not have passed it, but would have drawn cautiously on to see whether anything was in the way. They passed caution signals sometimes, where they expected to find them, but this signal only showed "danger" and "clear." He

had never had to complain of this signal. He kept his eye fixed towards the signal almost constantly, till he was within a few yards of it. Looking along the road, he saw it 300 or 400 yards off, just after passing a mineral train which was standing still on the up main line. There was another train behind this, and he could not see the road clearly by reason of the smoke and steam from those two engines. He kept his eyes also on the trains, fearing some one might come out from them. As he reached this point, and the smoke and steam cleared off, he saw right in front of his train, on the same line of rails, about 200 or 300 yards off, a break-van. He immediately reversed his engine; the steam was off, and they were able thus to slacken considerably. He saw nothing more after this, as the steam was coming out of the safety-valve; he merely felt the shock of striking the van. He noticed something, which he believes to have been the body of the van, immediately after striking; it was overhanging the bank. He thought his engine knocked the body of the van from its wheels, and then mounting the latter was thrown from the line on to the bank. He was on the foot-plate of the engine as it was taking its first turn; on the second turn he managed to get to the ground. He was too much bruised and hurt to examine the signals after the accident.

David Watson said he was a guard in the service of the Caledonian Company, had been so for 15 months, and had run with the fast trains for the last four months. He was riding in the front break-van next behind the tender. He could not say the exact time the tourist train left Carstairs the morning of the accident, as he was only assisting-guard, and did not notice the time particularly. He remembered approaching Shieldsmuir siding, and noticing the signals there; they were clear. He was looking to the front as he passed them. He could see the signal at McAndrew's siding, nearly a mile off; that was clear. He was watching it as they approached it, and then began taking out letters for Motherwell. He first thought there was something wrong when the driver whistled. He immediately put on his break, and had it on before the collision occurred. He had just time to look out and observe that the tender-break was on when his van was thrown off the line,—"a little bit" down the bank. Two carriages next behind it, and the leading wheels of a third carriage, were also thrown off the rails. He was not much hurt, and had not given up work. He did not notice the signal or signalman after the accident. There were a good many passengers in the train; he did not hear of anyone being hurt. He also gave evidence as to the composition of the train, which was similar to that given by the next witness.

The next witness, *William Stephen*, the conductor, was riding in a break-van, the fifth vehicle of the train. He was in the employment of both the Caledonian and the London and North-western Railway Companies, had been appointed conductor two years ago, and had been doing duty over the line from London to Perth for the last four years. The train on leaving Euston consisted of 10 vehicles, besides the engine and tender; viz., (1) a Greenock break-van, (2) a Greenock composite-carriage, (3) and (4) two composite-carriages for Perth, (5) a break-van for Perth, in which he rode, (6) and (7) two composite-carriages for Glasgow, (8) a 3rd-class carriage for Edinburgh, (9) a composite-carriage for Edinburgh, (10) a break-van for Glasgow. There was only one engine and tender to the train throughout the journey. The engines were changed at Crewe and Carlisle; and the Edinburgh composite-carriage was taken off at Carstairs. Otherwise the composition of the train was the same at the time of the accident as it was on leaving London. They left Euston on the night of the 29th of September, at 8.1 p.m., and reached Carlisle at 4.2 a.m. on the 30th, 17 minutes late. (He produced his note book.) They left Carlisle at 4.19, and Carstairs, with only nine vehicles, at 6.6 a.m., 15 minutes late. They were going well, at their usual speed. All the signals were clear. McAndrew's siding signal he saw nearly a mile off. There would have been quite sufficient time to pull up if it had been at danger, but it was nearly clear, quite clear for running. Like Watson his attention was first attracted to the fact that anything was wrong by the engine-driver's whistle. They were then rather more than half-way from Shieldsmuir, towards McAndrew's siding. After this he had just time to give a turn and a half to his break, when the accident happened; and he was thrown against the partition of his van, and was a good deal shaken, but had not been off duty since. As soon as he regained his feet he went to the rear-guard, Dixon, and sent him to block the line, as the Limited Mail was nearly due; and sent also to Motherwell for assistance. He then assisted the passengers; only one, Mr. Kerr, complained of injury, —an ankle-strain. After that he saw the engine-driver; he was very ill, and seemed much hurt at the time. The fireman was killed on the spot, having received some bad cuts about the head; the engine was upon him. The van next behind the tender was off the rails, resting upon the tender; the two next carriages were also off the rails. He spoke to the McAndrew's siding signalman, Revell. He asked him as to how the accident had happened; the signal was not on. The latter said the signal was put on. He (witness) replied it was put on too late. He did not notice the signals then, as he was surrounded by passengers. The train was a full train.

James Dixon, the guard who was riding in the last vehicle of the train, said he had been guard in the service of the Caledonian Company for four months. He confirmed the evidence already given as to the composition of the train, and as to the signals being clear. He could see the McAndrew's siding signal that morning when at the Wishaw station, about 1½ miles from it. He also was first attracted by "the whistle." He had time to put on his brake fully before the collision. His van was not thrown off the rails. The signal remained "clear" after the collision. He saw it "clear" when he got out of his van, and was standing by it, about 30 yards north of the signal. His attention was drawn to it when the conductor, Stephen, told him to block the line. The signalman (Revell) came to him, and the witness told him his signal was not on. Revell then rushed away to put it on; and either he or some one else did so. He saw the arm raised. Revell was quite sober. He confirmed the evidence already given as to the number of carriages thrown off the metals. The engine, having been separated from the tender, was thrown about 10 yards further down the bank, and was lying on its funnel, with its wheels in the air, and its leading end first. The tender was on its side. The van was in a similar position.

Mr. Ellison, of Crown Court, Cheapside, wrote that he was a passenger in a third-class carriage of the train; that the train was late at nearly all the stations, and 20 minutes late at Carlisle. He was thoroughly awake at the time of the accident. His attention was first attracted by the whistle,—three short, not very loud notes; immediately afterwards he felt the speed of the train greatly diminish; and he thinks the breaks were put on, and the steam was shut off, and that to this they owed their lives. He "adds "I got out immediately after the severe shock "or blow that brought the train to a sudden stand; "the tender having turned on its side seemed the "cause of their pulling up so shortly." He confirms the evidence as to the number of vehicles off the line, and he heard the engine driver (Boyd) say the signals were right for them to proceed.

Next follows the evidence of the guard, engine-driver, and fireman of the mineral train,—the van of which was in the way of the passenger train.

David Donaldson, the guard, said he had been a "regular mineral guard" for 12 months first, and then again afterwards. On the morning of the accident the break-van in which he rode left the locomotive sheds at Motherwell, pushed in front by the engine and tender which were behind it. He was in the van.

They ran towards McAndrew's siding. As they approached, the engine-driver gave two whistles, and told the pointsman (Revell) to put on his up distant-signal, and then the other one. He was looking from his van, and saw Revell work both levers (he was sure of this). His van at this time was about 6 or 7 yards north of the signal-cabin. He did not notice whether the arm of the signal went up to danger. Revell then went up, and held the south end points for the cross-over road, and then his van crossed over to the down line, clear of the points. The van was to have been pushed into a siding parallel to the main line, and the engine was to have gone into another siding. The next thing he, Donaldson, did was to uncouple his van; and then he was about to go and hold the points for it to be pushed by the engine into tho siding, when the fireman, James Irvine, cried out the express was coming. He attempted then to couple the van on to the tender, that it might be run away with; but the engine did not come close enough. The driver reversed the engine a little, but had not time to come closer, because the express was so near. The engine-driver then drove his engine forward, leaving the van. The witness went on to say he saw the collision occur within a yard or two of where he was standing. The body of the van was knocked off the wheels, and the engine mounted on the top of them. After this he went to the engine, which had been turned over and was lying down the bank, and tried to let the steam off, but he failed to do so; and then the engine belonging to his break-van came up, and he went on it to Motherwell for assistance. He returned about seven o'clock to the scene of the accident. He did not then or before notice the signal-arm from McAndrew's siding, as to its position; all he saw was that the levers were worked by the pointsman (Revell). He did not speak to him at any time, nor did he hear any conversation pass between him and the engine-driver of his break-van. He said they shunted in the same manner on the morning of the accident as they did every morning. They were going up to lift (take) waggons from the siding. He did not inquire about the trains that were likely to come; his engine-driver did that, and he heard him told by pointsman (Nicholson) at Motherwell that morning that the first train was 39 minutes late, and the limited mail 10 minutes late. It was a rare thing for them to pass into the siding before the tourist train had passed. They waited the usual time after the danger-signal was put on before crossing over; he could not say how long it was that morning,—some minutes, it might be four. (Rule 130 says three minutes.)

Henry Heron, the driver of engine No. 552, said he had been in the service of the Caledonian Company between six and seven years, driving the engines of mineral trains. This particular train, the break-van of which was the immediate cause of the accident, had been driven by him one week in every six during the last 12 months. The engine and break-van were in the habit of going thus to McAndrew's sidings to "lift" coal trains. When they got there, the engine and van crossed from "the up" to "the down" line, and thence the van was pushed into one siding whilst the engine went into another to fetch out coal trucks; and to the rear of these, after they had been drawn out, the van was coupled. On the morning of the 30th of September, the witness, with his engine, tender, and the van, left Motherwell sheds about 10 minutes past 6. The Motherwell pointsman (William Nicholson) told him, five minutes later, as he was leaving, "that the "first (Tourist) train" was 39 minutes late, and the "next (the Limited Mail) was 10 minutes late." On approaching McAndrew's siding he whistled twice to the pointsman there (Revell), who turned both the signals to danger; but he could not see the arms of the signals on account of the smoke of the engines in front of him. He then went on to say that he fell in with "Revell as the latter was walking from his cabin to "the points south of it." Witness spoke first, giving him Nicholson's information as to the time the trains were late. Revell appears to have made no answer, and the engine and tender went up to the points. Then Revell went south towards the points, and looked out; and nothing appeared to be coming. He then stood by the points and said "they were not "so much late as witness had said, but 19 minutes "and 11 minutes." Witness replied that that was the information he had got from Nicholson, and asked Revell to let him go across. Revell, as he thought, said "that the witness had four minutes any how, but "he must look sharp." He might have said "that if "his (Heron's) information was correct, there would "be plenty of time to cross; if he did, he did not "recollect it." Witness had no doubt there was plenty of time, and was working according to Nicholson's information. He was at the siding about two minutes altogether. This was about the usual time to keep them (on the up line before crossing) when the road appeared to be clear, as it did then. Revell then let them cross over to the down main line, and they went along it till they were clear of the points. At this moment his fire-man cried out "Here's the express!" and, looking back, he saw it coming towards them, being only 300 or 400 yards off. Heron then, to use his own words, said, "with the agitation of this I reversed my engine, "and put on steam. When I noticed the van was "off (I did not know it was uncoupled), I came "back again to join it, but there was not time, so I "went away with my engine, leaving the van to be "run into by the express. I had not got about 10 or "15 yards before the collision occurred. We were "running when it happened, and had only just time "to get out of the way." His engine was not struck, or injured at all by the accident. After it had happened he went to Motherwell for assistance, and did not notice the signal or speak to Revell the signal-man; but the latter was "all right" when he let him cross at the siding. They were merely doing that morning what they usually did, viz., to cross into the siding before "the (Tourist) Express." They very seldom got away with their waggons before it, and should not have done so that morning. They had at times waited 40 minutes in the siding for it, but more often 15 to 20 minutes; sometimes they had information as to how much it was late, sometimes they had not.

James Irvine, the fireman, who was off the engine and standing at the side of the line at the time of the accident, gave confirmatory evidence,—amongst other things, as to not being able to see the signal on account of the smoke from the engines in front, and from the Excelsior ironworks, and further said; "I saw "the express run into the break-van, the break-van "coupling was broken, and the engine pushed it a "little along and then went past it and tumbled over "on its side. I could not distinguish more on account "of the steam." They could not see far up the line as the express approached, in consequence of the steam and smoke of other engines shunting above them. One engine passed on the up line just before the accident, and two other engines had gone up just before them.

This evidence was immediately followed with that of *William Nicholson*, the pointsman at Motherwell, and *John Carruthers*, the telegraph-clerk at that station, to clear up the difference of the train time received by Revell, the McAndrew's siding signalman, and that brought by Heron, the mineral-train engine-driver. Nicholson said he was 18 years of age, and had been about four months a pointsman, and 12 months altogether in the service of the Caledonian Company. He frankly admitted the truth of what Heron had said, and that he had mistaken the entry in the time-book kept at the Motherwell station by the telegraph-clerk (Carruthers) for the information of the Companies servants, as "tourist train at Beattock summit as 5.53," a.m. instead of 5.33. Hence the error. The book was produced, and a flourish appeared on the first "3," which certainly might have deceived him. He said he had examined the book in order to keep the line clear if necessary. It was on a counter, separated from the telegraph-clerk by a partition. The latter was busy and did not tell him; he looked for himself, as

"Up distant-signal requires a new lamp;" also down distant-signal out of proper working order; the last signal the witness himself repaired. He did not examine it till the 2nd of October, the third day after the accident. It then worked well. There were several other signals like the McAndrew's siding one, but the generality of signals differed from it in the leading of the wire; instead of running straight from the cabin to the signal with one crossing, it had two crossings; it crossed the main line, and then afterwards crossed the down siding, so that it had two bends; but this should not interfere with the working. He had never heard it complained of but the one time mentioned. He could not account for its sticking. He had not heard of the reports to Millar about it; they would be sent to Mr. Currer and forwarded to Mr. Graham, the chief engineer, who was head of the department. If the witness were out on the line, the reports would be forwarded to the shop and executed at once, and so he might not know of them. Could not say when he last examined the signal at McAndrew's siding before the accident. He had no complaints of any consequence about the other signals which were similar to McAndrew's siding. The weather affected them. A weight was attached to the lever to adjust them; it was raised up or down according as the weather affected the wire.

Mr. Graham, chief engineer of the company, explained that reports sent to the superintendent's office, would come on to him, and go on to the last witness.

At a later period evidence was taken as to a small piece of iron, which was attached to the signal itself, at the signal-post, in addition to the lever, and a ganger, *James Martin*, said it was commonly done; he had put one on at Shieldsmuir and might have done it to the McAndrew's-siding signal; "it was for force; in a wet day the signals went up very well, but not so on a dry day." The McAndrew's siding-signal worked badly. It was not satisfactorily explained who put the particular piece of iron on the McAndrew's signal, though all available evidence was exhausted. It was said to have been on for some considerable time.

Mr. Thomas Reid, outdoor inspector of pointsmen from Carstairs to Glasgow for the Caledonian Company, said, Revell, the McAndrew's siding man, was a careful and steady man. Revel had been under him 11 months. He had to protect the Flemington siding as well as McAndrew's siding, by putting his signal to danger and ringing his telegraph-bell. He confirmed the evidence already given as to the practice of shunting the trains at McAndrew's siding. If Rule 130 (to station-masters and clerks), which directed "That no "engine,carriage, or waggon must be allowed to shunt "upon or cross the main line until the proper signals "have been set at danger for three minutes" were strictly followed, there could be no accident. Of course that included the distant-signal being put at danger in sufficient time to enable the train to stop. Three minutes was sufficient for that. There was also a working rule as to the trains, other than the Limited Mail; if any of them were more than 10 minutes late, shunting went on. This was necessary, for there had been great delays of the mineral trains there, which were awkward and expensive. Moreover a telegraph-apparatus had been placed in McAndrew's siding cabin lately, which Revell was trying to learn; and a boy was soon coming to teach him, in order that he might know better when the trains were coming, and so facilitate the shunting, and not have the engines waiting and blowing off steam in the siding, and that they might go to Lesmahagow junction. The coal traffic had increased there and all over the line "miraculously" in the last two years. He was at the scene of the accident an hour afterwards; the McAndrew's-siding signal worked well then, he tried it, it was at danger. It had never been reported to him. He confirmed the evidence already given as to the position of the engine and tender, and the van, and the carriages off the rails. The engine was turned over, about 80 yards from the place where it struck the van. The metal buffers of the van were lying on the line where it had been struck. The road was torn up for about 4 lengths of rails, or 32 yards from where the carriages were off.

We come now to the evidence of the chief signal officer for the southern division of the Caledonian Company. *Mr. Robert Currer* said he had occupied his present position since January 1st, 1873. He stated the details of the working of McAndrew's siding similarly to those already given. The signalman was there daily from 5 a.m. to 5 p.m.; there was no one there at night. It was not necessary; the coal traffic was during the day. The new telegraph-apparatus had been placed there two or three weeks before the accident. It enabled communication with Garrion Gill, which was about 4 miles south towards Carstairs; but Revell did not understand the use of it yet. There was a bell in the cabin to protect the trains coming out of the Flemington siding; this was rung by the Windmill Hill signalman, and the McAndrew's signalman would then put on his distant-signal to danger. Revell signed the book of rules on the 5th of December 1870 (book produced), when he first joined the Company's service as a porter. He was appointed signalman in August 1872, at Windmill Hill, and in March 1873 at McAndrew's siding. Any breach of Rule 130, which was the only one that applied to Revell, ought to be reported. He had had no reports this year. He had no reason to doubt that it was observed. He saw the McAndrew's siding-signal about four hours after the accident, and it worked very well then.

Mr. George Graham, the engineer of the Caledonian Company for the last 20 years, gave evidence as to the permanent way, the various cabins, points, signals, and places above mentioned, and their distances from each other, and also the gradients of the line. The McAndrew's siding had existed for 14 or 15 years; but the number of sidings had been increased to accommodate the traffic. There was always a signal-cabin there. Flemington siding had been there 15 or 16 years. There were the sidings of two collieries and a stone-quarry communicating with the main line there. Some of the sidings had been added since they got the line in 1848.

The evidence of the witnesses concludes with that of two chief officers of the Company.

Mr. Henry Ward, the traffic-manager of the Caledonian Railway, and who had been so for many years, said he knew well McAndrew's siding, the signal-cabin, and the other places referred to in the course of the inquiry. With regard to the process of signalling in such cabins, he said that the telegraph for general purposes was only just being introduced. Shieldsmuir, Pather, and Motherwell are connected with bell-signals. It was only of late years that the information that trains were passing was obtained by Garrion Gill station from Carstairs, but all trains were "belled" to and fro between Pather and Shieldsmuir, and to and fro between Shieldsmuir and Motherwell. He gave similar evidence to that already given, as to the shunting at night at McAndrew's siding, viâ Shieldsmuir. He said the signalman at the latter place had the tail-lights of the van of the shunting train to guide him as to its departure, in addition to the whistle before mentioned. If the Shieldsmuir signalman did his duty he should not allow any train to go forward unless he was sure the line was clear, and therefore fog and high wind did not matter. The present process at night economised very much. It was simple when there was little traffic. There was not any appreciable traffic at night as compared with the day traffic. The present arrangement was quite safe. The engineman whistled, the signalman heard him, and he stopped everything coming down. If he did so long, he would know there was something wrong, and then allow the train stopped to proceed cautiously, more or less so according to circumstances. The tourist train passed McAndrew's siding while there was a signalman there. It was true there were other fast trains during the night when there was no signalman there, but then the work was over. The

shunting did not begin till about 4 o'clock a.m. Occasionally there might be a train or two to be taken out, but it was exceptional. They had not been able to get the block-telegraph yet so far along the line; they were doing it as fast as they could. They had got 54 or 55 miles from Carlisle to Perth under it out of the 151 miles. Thirty-eight miles more could be opened within two or three months, and the rest, including McAndrew's siding, within a year. The present arrangements there were perfectly safe if the rule 130 were obeyed, and the signalman would have the telegraph to assist him when he knew how to use it. But this accident was due to the unfortunate mistake in the reading of the Motherwell book. The frost may have caused the signal to stick, but the man might have gone on the bank to see whether the signal was on. This should not, however, be pressed. There was no locking-apparatus at the McAndrew's cabin, but there was at Shieldsmuir and other important stations. The Shieldsmuir signalman was learning the telegraph. It would not be possible to keep all the mineral trains off the line till the fast trains had passed. They worked the mineral trains as best they could at early morning and midday. He admitted that if the block-telegraph system were working there, it would be much better. He would see that it was put there at once. However, the telegraph was not infallible. They looked not merely to convenience, but to safety in everything. He would repeat that the signal-man was bound by rule 130, though it was specifically addressed to station-masters and clerks, and he was a pointsman In the new regulations this would be altered. The regulations were about to be revised.

Mr. James Smithells, general manager of the Caledonian Company, confirmed what Mr. Ward had said as to their efforts to introduce the block-system of telegraph as fast as they could, but there was great difficulty in getting the apparatus and the people to work it. Mr. Graham was doing everything that could be done in this direction. The directors of the Company were most anxious at all times on this and other points to promote the convenience and safety of passengers. Last session they obtained an Act for a new line, from Garrion Gill to Orlitto, and thence to Easton, so as to have an independent line on which to work the passenger traffic, and thus to relieve the present line by Garrion Gill and Wishaw, and down to Addistone; and they would then be enabled to work the mineral traffic without detaining their engines. At the present time the Company suffered great loss from keeping engines standing in order to let passenger trains go safely and quickly through. This was the best remedy for an overworked line. Moreover, the directors had doubled the line from Garrion Gill to Glasgow, which would greatly economise their working and add to their convenience. To return to the blocking and interlocking, they had the work of Messrs. Stevens and Son and Messrs. Saxby and Farmer. Inspector Reid had been put on to attend to it, and Mr. Currer had been specially appointed to assist Mr. Ward in carrying out the telegraphic signal arrangements.

This closed the evidence of the witnesses, 33 in number, all of whom were officers or servants of the Company.

Afterwards the following reports were handed in with regard to the down distant-signal at McAndrew's siding, explaining Alfred Muirden's statement that it would not "work with pleasure."

CALEDONIAN RAILWAY.

Coaching Department.

MEMORANDUM, McAndrew's siding station to Motherwell station, Thursday the 16th day of January 1873.

ector Millar, Motherwell.

I HAVE to report to you that the platelayers led the wire of my down road signal four am of opinion the wire is not sufficient.

Yours truly,
A. MUIRDEN.

CALEDONIAN RAILWAY.

Coaching Department.

MEMORANDUM, McAndrew's siding station to Motherwell station, Monday the 20th day of January 1873.

Inspector Millar,
DEAR SIR,
Referring to my former memo.

THE wire of my down road signal has again broken. I will feel obliged if you would see into the matter and have it thoroughly repaired, as the platelayers have had to mend it five times now, and it will likely just break again.

Yours truly,
A. MUIRDEN,
Pointsman.

Caledonian Railway Company,
District Superintendent's Office,
3, *Germiston Street, Glasgow,*
DEAR SIR, *20th January* 1873.

Geo. Graham, Esqre., C.E.,
Down distant-signal at McAndrew's siding.

THE wire of the down distant-signal at McAndrew's siding is reported insufficient, having broken several times, and trains have been stopped thereby.

Be good enough to give the matter your immediate attention, and favor

Yours truly,
for R. Currer,
J. DISHURGHEN.

Conclusion.

The chain of evidence is complete as to the circumstances under which this collision occurred. A break-van, about to be attached to a mineral train, obstructed the down main passenger line of the Caledonian Railway, at a time when a passenger train from England for Scotland, known as the "tourist express," was overdue, near McAndrew's colliery sidings, on the south of Motherwell, unprotected by any signal. The engine-driver of the passenger train, after emerging from smoke and steam caused by engines on the up line near Shieldsmuir, was only able to see the obstructing break-van when he was within 200 or 300 yards of it. He did his best to reduce his speed, but his engine came into collision with the break-van with such violence that the engine and its tender were thrown off the rails, as well as several of the vehicles behind them; and the engine and tender fell down the slope of the embankment on the near side of the line on which they had been travelling, while the break-van and carriages remained, fortunately, on their wheels at the top of the embankment.

After hearing and carefully considering all the evidence that was available, and after twice visiting the locality, we have come to the following conclusions in this matter:—

No blame can be attached to the engine-driver of the tourist express train, John Boyd, inasmuch as he found the distant-signal from McAndrew's siding lowered for him to proceed northward, and he did not receive warning of the obstruction in time to enable him to stop short of it. Of eleven vehicles, three were break-vans; and there was thus, fortunately, a greater proportion of break power than is frequently found with express trains. To this circumstance, and to the watchfulness and activity of the engine-driver, conductor, and guards, the safety of the passengers must be attributed.

The signalman at Shieldsmuir, Alfred Muirhead, who had no means of communication with the signalman at McAndrew's sidings, was justified in lowering his signals for the express train to pass. But if this part of the main through line of the Caledonian Railway had been properly worked on the block-system, then the main line at McAndrew's siding would not thus have been obstructed without "line blocked"

having been first given to and acknowledged from the Shieldsmuir cabin; and in that case the tourist train would not have been allowed to pass the Shieldsmuir cabin, and the collision would not have occurred.

The signalman, George Robert Revell, at the McAndrew's cabin, showed care and attention, by calling at the Motherwell station in the morning, and not merely ascertaining, but also writing down, of his own accord, and for his own guidance, the times at which the tourist express train and the limited mail train had respectively been reported to have left Carlisle; the former 18, the latter 11 minutes late. He would naturally have been thrown off his guard in some measure by the later intelligence of the mineral engine-driver, Henry Heron, to the effect that the tourist train was 39 minutes late; and it appears, further, that the tourist train had actually made up time before the accident, though the times given by the different witnesses vary considerably. Thus misled, and unable to obtain direct information, he turned the engine, tender, and break-van across from the up to the down line at a time when he ought to have kept them waiting on the up line, and when the tourist express train was only too nearly approaching. It has been pointed out on behalf of the Company that if this signal-man had obeyed rule No. 130 in the book of printed regulations (already referred to in the evidence of Mr. Reid), which runs as follows, "No engine, carriage, or waggon must be allowed to shunt upon or cross the main line unless the proper signals have been set for three minutes," then the collision might not have occurred. But it does not appear to us to be right or just to allege culpable neglect of duty against the signal-man for disobedience of this rule, for two reasons:—In the first place, it is printed amongst the regulations which are specially addressed to station-masters and clerks, and it is not found amongst those drawn up for the guidance of signalmen and pointsmen; in the second place, it is not, according to other witnesses, a rule which is strictly carried out in practice. There can be no doubt that the signal-man turned the lever of his signal to danger before setting the mineral engine and van across to the down line; and it is equally certain that the signal-arm on the semaphore post about 800 yards from him, failing to rise to the position of danger as he did so, remained *down* as the tourist train passed it, and even after the collision, until, by jerking the wire, the engine-driver of a pilot-engine, John Mason, caused it to fly to danger. The statement of the signal-man, that the steam and smoke from engines near Shieldsmuir prevented him from seeing whether the arm of the distant-signal responded to the action of his signal-lever is corroborated by other evidence; and he is thus absolved from any real want of due and proper care in not seeing that the distant-signal arm went up to danger before he held the cross-over-road points for the mineral engine. We have, therefore, come to the conclusion that he was honestly acting for the best under the difficult circumstances in which he was placed. It was not his fault that he was unprovided with the means of more direct information as to when the tourist train was to be expected, that he was mis-informed by the engine-driver from Motherwell, or that his distant-signal did not act properly. Looking to the practice of such men in such cases, it cannot be alleged against him as neglect of duty, that he did not take further steps to ascertain that the signal-arm (800 yards from him) obeyed the signal-lever when he pushed the latter over to the position of danger. Though there is no doubt now that he would have acted more prudently if, adhering to the information he had himself obtained at Motherwell, he had detained the mineral engine on the up line, yet it must be admitted that according to common experience the train was more likely to lose time than to make up time after leaving Carlisle. Then, again, the driver of the mineral engine only repeated to the signal-man the information which he had received, and which he had no reason to doubt, from William Nicholson, the pointsman at Motherwell. This pointsman read wrongly from the record-book at that station a figure which had been entered correctly, but not as unmistakeably as it might and should have been written; and the telegraph-clerk who made the entry did not foresee that the flourish which he unfortunately added above the figure 3 would lead to its being mistaken for the figure 5, and to the disastrous results that followed on such a mistake.

Under all the circumstances of the case, we are compelled to attribute this accident to the want of better arrangements and better appliances for the working of the traffic on this section of the line, rather than to blame any of the servants of the company concerned. We are glad to learn that the Caledonian Company have at length been aroused to the necessity of adopting the block-system, and applying locking-apparatus, on this important portion of their line; and that a deviation line for the accommodation of the through passenger-traffic is contemplated; but we cannot avoid expressing surprise that it should so long have been worked in so inefficient a manner. The distant-signal which failed on this occasion had already been a subject of complaint, as will be seen by the evidence of the signalman, Alfred Muirhead, previously employed at the same spot, and his written complaints already quoted; and a broken portion of a coupling-link had been very roughly hung by the side of the weight on the post, as we observed on the spot, in order the better to cause the arm to fly to danger. A telegraph-instrument which had a few weeks before been fixed in the cabin was useless because the signalman had not learnt to make use of it. It is not too much to say that at least telegraphic information should long since have been afforded to signalmen competent to receive it; and signals in a thorough state of adjustment should have been provided in such a locality, pending the application of the block-system, and of improved signal arrangements, with locking-apparatus, which were so much required on a line of this description, used for through fast trains and heavy mineral traffic.

It is satisfactory to find that the printed Rules and Regulations of the Caledonian Railway Company, copies of which were produced at our inquiry, are about to be revised. The rules addressed to the signalmen should obviously be clear and complete in themselves; and it ought not to be necessary to refer to rules specially addressed to station-masters and clerks in order to ascertain the duties of signalmen. It is further of the highest importance to discipline, and to the safety of the traffic, that those rules only should be laid down which can be carried out in practice, and that to such rules as are laid down obedience should be strictly enforced.

I have, &c.,
H. W. Tyler.

I concur in the above report.
W. W. Ravenhill,
Legal Assessor.

The Secretary,
(*Railway Department*),
Board of Trade.

THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE,
DATED THE 13TH OCTOBER 1873,

INTO THE CIRCUMSTANCES ATTENDING THE COLLISION ON THE

NORTH BRITISH RAILWAY

WHICH OCCURRED AT

MARYHILL

On the 4th October 1873.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

[C.—934.—III.] *Price 7d.* 1874.

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I have, &c.,
H. W. TYL

I concur in the above report.
W. W. RAVENHIL
Legal A

The Secretary,
(Railway Department),
Board of Trade.

THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE, DATED THE 13TH OCTOBER 1873, INTO THE CIRCUMSTANCES ATTENDING THE

Collision on the North British Railway which occurred at Maryhill, October 4th, 1873.

SIR, 1, *Whitehall*, 10*th December* 1873.

IN compliance with the instructions contained in your minute of the 13th of October, I have the honour to report, for the information of the Board of Trade, the result of the Public Inquiry into the circumstances which attended the collision that occurred on the 4th October at the Maryhill station, on the Helensburgh branch of the North British Railway.

In this case, a "workman's train" running on Saturdays only, and leaving Dumbarton at 2.20 p.m., came into collision about 3.10 p.m. at Maryhill, at which station it was not due to stop, with a mineral train, on the up main line, opposite the passenger platform. One of the passengers, a workman in the company's employment, was killed, and 24 other passengers were injured.

The Court sat in the Council Chamber, kindly placed at our disposal by the Lord Provost at Edinburgh. After a previous inspection of the site, the proceedings were opened on the 25th of October, and were then adjourned to enable the engine-driver of the workman's train to lay further evidence before us. After due notice, the investigation was resumed and concluded on the 29th of November. On both occasions a great number of witnesses were examined.

Description.

The railway from Helensburgh to Glasgow runs generally in an easterly direction, and passes Dumbarton, Milngavie junction, and Garscube siding, at distances, respectively, of about 11½ miles, 1¾ miles, and three-quarters of a mile, from Maryhill. From nearly 300 yards west of the Garscube siding cabin, and for 800 yards to the east of it, there is a curve in the line, with a radius of 30 chains. The last 300 or 400 yards of this curve passes through a cutting, which is spanned by a road-bridge over the railway. The cutting and bridge much obstruct the view of an approaching engine-driver, and prevent his seeing the condition of the line at the Maryhill station till he is within 639 yards of it. The line thence is straight, with a gradient falling 1 in 152 towards Maryhill for the first 337 yards. Then succeed 176 yards on the level over a viaduct crossing the river Kelvin, and the last 126 yards fall 1 in 900 towards Maryhill.

At the Maryhill station there are two lines of railway between two platforms. A signal-cabin stands near the east end of the up platform, containing telegraph-instruments for working the block-system between the Cowlairs junction and this cabin; and there are also instruments, not yet in use, which will enable the block-system to be established towards Helensburgh on the opening of the Stobcross branch, which may not be for 12 months. Meanwhile communication is kept up between the signalmen in the Maryhill and the Milngavie-junction cabins by means of a telegraphic-bell, by which they inform each other as to the class of engine or train which may be expected. They employ one, two, three, or four beats of it for a passenger train, a goods train, an engine, or a mineral train respectively. From this cabin there are worked a home-signal 20 yards on the east of it, and a distant-signal 758 yards on the west of it. The levers for working these signals are on the outside of the cabin and immediately to the east of it. There is a cross-over road between the up and the down main lines, of which the east points are nearly opposite to the cabin, and the west points are about 50 yards from it, at the west end of the down line platform. At 542 yards from this cabin, and on the west of it, there is a small cabin provided with levers and locking-apparatus for working the signals and points in connection with a cross-over road and with the Corporation of Glasgow Gas Works sidings. The signalman in this latter cabin works a home-signal nearly opposite to it, and a distant-signal 727 yards from it, with a small repeating-arm on the distant-signal post of the Maryhill cabin. This latter distant-signal post is on the slope of the cutting, 10 or 12 yards to the west of the bridge over the line already mentioned, and 52½ feet above the line; and it is well seen from the Maryhill signal-cabin, and by an engine-driver approaching from the west for 384 yards before he reaches it. This signal-post has three arms on it;—two on the side of the railway, namely, the Maryhill distant-signal above, and the repeater from the Corporation of Glasgow Gas Works siding below; and one on the opposite side of the post, on a level with the Maryhill distant-signal-arm, used as the Garscube down distant-signal. The sidings at this station, which are three in number, are connected with the down main line by one set of points, 40 yards to the west of the down platform, near a goods shed. These siding-points are worked by a lever on the ground near them, which is not interlocked with the signals. On the east of the Maryhill cabin there is a lever for working both ends of the cross-over road, not interlocked with the signals.

Summary of Evidence.

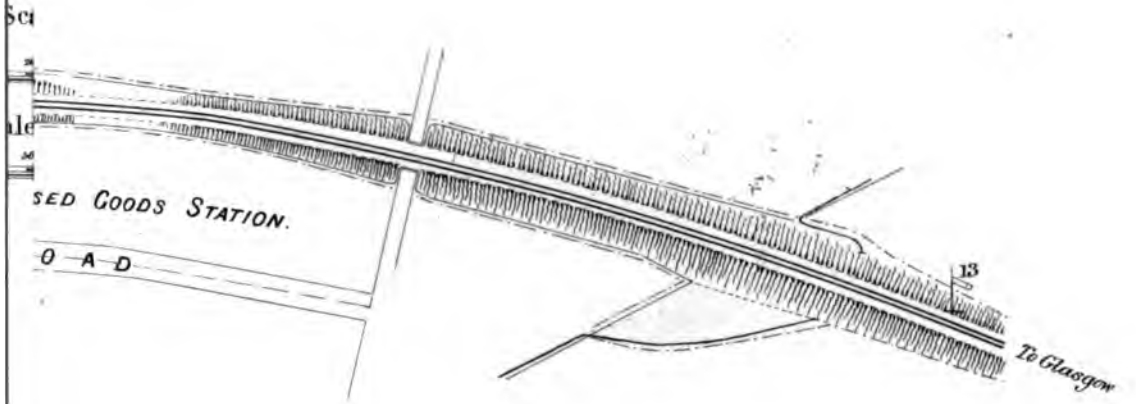
On Saturday, the 4th of October last, the "workman's train," which, as already stated, runs on Saturdays only, left Dumbarton at 2.42 p.m., 22 minutes late, its engine having been previously detained in taking another train to Helensburgh. It consisted of an engine and tender, six carriages, and a break-van, which was the last vehicle of the train, and in which rode William Fogo, the guard in charge. The engine was driven by Peter McNemeny, who has been for 24 years on this section of the North British Railway. It stopped at Dalmuir and Bowling; and, as it approached Milngavie junction, the signalman there gave the usual notice on his telegraph-bell to the Maryhill cabin. Having received permission for it to proceed, he allowed it to pass him, which it did at 3.7, 26 minutes late, and he made an entry of the time in his book. This signalman says the speed of the train was "ordinary," and the signalman at Garscube, a mile further on, calls it "ordinary express speed." The latter does not know at what time it passed him, as he has no clock or book in his cabin. Shortly afterwards it passed the point where the first sight of the Maryhill distant-signal is obtained, and after proceeding about 200 yards further it arrived opposite to the Hillhead Gasworks, which are about the same distance to the right, away from the railway, in a field across the Forth and Clyde Canal. Several passengers stated that just before reaching this spot the engine-driver slackened speed considerably, and two of them thought he was going to stop altogether; but he increased his speed again almost immediately, and seeing, as he says, the Maryhill distant-signal "perfectly clear," the arm right down the post, he went on. The engine-driver stated that the signal was in the same condition when he passed it, for he looked broadside at it. As he

To accompany Report of Public Inquiry into the Collision which occurred at Maryhill, of 4th October 1873.

ITISH RAILWAY.

N SHEWING

ARYHILL STATION.



Scale for Plan.

Feet 100 50 0 100 200 300 400 500 Feet

Vincent Brooks Day & Son. Lith.

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE
DATED THE 11TH NOVEMBER 1873,

INTO THE CIRCUMSTANCES ATTENDING THE COLLISION ON THE

NORTH-EASTERN RAILWAY

AT

DURHAM STATION

On the 6th November 1873.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

[C. 934.—IV.] *Price* 7½*d.* 1874.

THE REPORT OF THE COURT OF INQUIRY

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE DATED THE 11TH NOVEMBER 1873, INTO THE CIRCUMSTANCES ATTENDING

The Collision on the North-Eastern Railway at Durham Station, on the 6th November 1873.

Board of Trade,
(Railway Department),
Whitehall, 19th December 1873.

SIR,

IN compliance with the instructions contained in your letter of the 11th November, I have the honour to report, for the information of the Board of Trade, the result of the formal investigation into the causes of and the circumstances attending the collision which occurred on the 6th November at Durham station, on the North-eastern Railway, between the 1 a.m. down Scotch express passenger train from York to Edinburgh, and a train of empty carriages which was being shunted from one siding to another. One female passenger was killed, and 13 passengers appear to have been more or less seriously injured on this occasion.

This public inquiry was held under the provisions of the Regulation of Railways Act of 1871, with the assistance of Mr. W. W. Ravenhill, barrister-at-law, as legal assessor, in the Guildhall of Durham, which the Mayor of that city was good enough to place at our disposal. The sittings commenced on Friday, the 21st of November, at 10 a.m., and ended at 7 p.m., and were resumed on the following day at 9 a.m., and closed at 7 p.m., after having examined 18 witnesses. The inquiry could not have been completed on the second day, had not the legal adviser of the two signalmen who had been committed for "manslaughter" on the verdict of the jury at the coroner's inquisition, but admitted to bail, determined, at the last moment, not to submit them for examination.

The evidence of the various witnesses was taken on oath, and their statements written down, and having been read over to them, were duly signed, and are sent herewith.

The main lines of the North-eastern Railway at Durham lie in a north-eastern and south-western direction. There are four lines of railway between the up and down platforms of the station; the two central lines constituting the up and down through lines, mostly used by trains that do not stop at Durham station, and the outside lines that lie alongside of the up and down platforms, and are called platform lines, by passenger trains which arrive at and depart from Durham station.

At the south-western extremity of this station, where the platform lines diverge from the two main or central lines there is a cabin or telegraph signal-box erected above and across the main lines, called the West cabin, from which the points and signals at that end of the station are worked by rods and levers. The signals there protect the entrance to the Durham station from the south-west for all down trains. There are also some sidings lying to the south and east of the up platform, which are entered from the same spot by trailing points on the up main line, but these are not mixed up with the present collision.

At the north-eastern extremity of the station there is another signal-box, called the East cabin, from whence the points and signals are worked that control the entrance to the station from the north-east, including the junction of the line to Leamside and Sunderland with the main line to Newcastle, as well as the connections with the docks or sidings lying on each side of the platforms, the entrance to the engine-shed, and the cross-over road to pass from one main line to the other. The points and signals in these cabins are interlocked with each other. The distance between these two cabins is about 314 yards, and the station lies between them.

The approach to Durham station on the down line from the south-west is further protected by a distant-signal worked from the west cabin, and distant from it 861 yards, but owing to a curve and cutting in the line, this distant-signal cannot be seen from this cabin, and in consequence, a repeating-signal which is in sight from it has been put up at a distance of 501 yards.

The two down home-signals immediately above the west cabin are lit at night by gas; the upper signal is for the platform, and the lower for the main line; and they serve as the down distant-signals for the east cabin. The upper signal was stated to shew at night, the brighter light of the two, and the mechanical arrangements connected with these signals are such, that they cannot be taken off by the west cabin signalman without the consent of the east cabin signalman. The west cabin signalman can move the levers, but he cannot alone lower these home-signals.

The down distant and down repeating-signals, on the contrary, are not thus controlled, and these signals can be taken off by the west cabin signalman when he has moved the levers of the down home-signal with the view to their being taken off.

Before quitting this part of the subject, it is also requisite to explain that the east cabin signalman cannot open the points of the cross-over road for a train to be shunted across from the up to the down main line unless all the up and down signals are on at danger; and, in the same manner, he is prevented from opening the trailing points on the down main line that lead into the docks or sidings that lie alongside of each other, parallel to the main lines, and at the back of the down platform, unless the down home-signals and the down distant-signals, worked from the east cabin, but placed above the west cabin, are actually on at "danger," these down distant-signals, as before stated, constituting the west cabin down home-signals. The easternmost of these sidings is called the Sunderland dock, and the westernmost the Newcastle dock.

The portion of the main line of the North-eastern Railway passing through Durham station, between Darlington and Newcastle, is worked, with the assistance of the electric telegraph, on the absolute block system, with the exception of a short section through Ferry Hill station.

The east and west cabins are, in consequence, used as two telegraph stations, and are fitted up with telegraphic instruments, and signalmen are employed there day and night.

The next telegraph station to the south-west is situated at Relly junction, where the line to Bishop Auckland leaves the main line to Darlington and York. Relly junction is 1,565 yards distant from the west cabin, and the line from Relly junction falls towards Durham on gradients of 1 in 101½ and 1 in 120 to a quarter of a mile beyond the east cabin.

The company's general superintendent of passenger traffic (Mr. Christison), who compiled the "Regulations for Train Signalling by Block Telegraph System" (copy enclosed), stated that it was the intention

and in accordance with the practice, as far as non-stopping down trains were concerned at Durham station, that the signalman in the west cabin, when he received the telegraphic signal "be ready" from Relly junction for a down train, was not *at once* to acknowledge it, even if the down line was clear up to his cabin, but to wait until he had given the "be ready signal" to the east cabin, and had had it acknowledged by the signalman there, signifying that the line was "clear" up to the east cabin; and then, and not till then, he was instructed and authorised to acknowledge the "be ready" signal received from Relly junction; but he admitted that no express stipulation to that effect could be found in these "Regulations." Mr. Christison, however, contended that it was the duty of "the west cabin signalman, "under the 4th section of Rule 7, to see that the "line was clear for 300 yards beyond his cabin; "and that if there was a junction at which the "signalman could, within 300 yards, bring a train or "engine upon the main line, then the signalman at "the west cabin (or B) must, in compliance with "words in Rule 2, which require him to ascertain "whether the line is clear for the train to run upon, "give the signals to the east cabin (or C), prescribed "by the Rule 2, and thus receive his assurance that "the line would be kept clear before repeating the "'be ready' signal to the west cabin (or A)." It is sufficient to remark that no such instruction is contained in Rule 2. He also stated that these regulations had been approved by one of the inspecting officers of the Board of Trade, Colonel Hutchinson. That officer has been referred to, and states that he had not had occasion to consider these regulations, but had only approved of the 6th section of the 7th Rule, which relates to no two trains being permitted to approach a fouling point at the same time.

Again, by the company's book of "General Rules and Regulations," Article No 54, it is laid down that, "the main line at stations shall be kept clear, if pos-"sible, *Ten Minutes before a Train is due;* and no "engine, carriage, or waggon shall be shunted on or "from the main line until a proper signal has been "previously sent back or exhibited in one or both "directions, as may be required." But when a train is known to be late, this ten minutes is considered to commence from the time when it may then be expected to arrive; and in order to make the signalmen in the two cabins cognizant of the whereabouts of the through or non-stopping trains, it is the practice to telegraph their time of departure or passing from York, Darlington, and other stations to Durham.

These telegrams are received, in the first instance, in the telegraph office at Durham station, and then telegraphed on by the telegraph clerk to the two signalmen in the east and west cabins.

It was asserted that Rule No. 54 is observed with regard to all non-stopping trains, but not strictly observed for stopping trains.

Now it appears that on the 6th November, about 2.34 a.m., a light engine arrived by the up line from Sunderland, and by the permission of the east cabin signalman, and with his assistance in opening the points, it crossed from the up to the down main line by the cross-over road, and was thence backed into the Newcastle siding and hooked on to six carriages and two vans standing there, and which were intended to form the first train from Durham to Sunderland at 5.30 in the morning. The driver next proceeded, still with the permission and assistance of the east cabin signalman, to draw his train ahead out of the Newcastle siding and on to the down main line, for the purpose of backing it into the adjacent Sunderland dock or siding next to the back of the north end of the down platform; and he was in the act of backing this train into the Sunderland dock when the collision occurred, about 2.37 a.m.

No blame appears to attach in any way to the driver and fireman of this light engine, as they were only carrying on their ordinary work in obedience to the signals exhibited by the east cabin signalman.

The down Scotch express which ran into the train of empty carriages is due to leave York at 1 a.m.; it does not stop at any station between York and Newcastle; the distance between these places is 82¾ miles, and 1 hour and 48 minutes is allowed for the journey, so that the average rate of speed is about 46 miles an hour; but it was stated that down trains travel somewhat faster on the portion between York and Darlington, than between Darlington and Newcastle, and a notice was issued by the company's locomotive superintendent (Mr. Fletcher), during the present year, that the speed of engines and trains, through Durham station, should not exceed 20 miles an hour when passing over the viaduct at the west end of the station.

The company's time tables do not show, as they undoubtedly should do, for the information and guidance of the company's servants, the better to provide for the safety of the public travelling on the North-eastern Railway, the times when through or non-stopping trains, if running punctually, should pass those stations where shunting may possibly be done; but it was stated, that the down Scotch express was due to pass Durham at 2.28. a.m., whilst it has been shown that the light engine arrived then, and passed to the down line and into the sidings at 2.34 a.m., six minutes after the Scotch express actually became due.

It was admitted by all parties concerned that no telegraphic or other communication reached the signalmen in the east or west cabins, showing how many minutes the down Scotch express was late in leaving York, or in passing any other station that morning; and it did not appear that either of these men attempted to obtain this information from the telegraph clerk at the station, although it was stated that it was their duty to have tried to procure it.

In the absence of any such information, the east cabin signalman certainly was not justified in allowing the light engine to cross, occupy, and foul the down main line, any time after 2.18 a.m., according to rule No. 54, particularly as there was no hurry or pressure in placing that light engine in front of the empty carriages, and in drawiug them out of the Newcastle dock and in placing them in the Sunderland dock, as there were three hours during which that might have been done.

It is true that the telegraphic clerk, an intelligent lad of 15, employed in the telegraph office since August 1872, said that he received a telegram from York at 1.30. a.m. to the effect that the down Scotch express left York at 1.20 a.m., or 20 minutes late; and it is as well, perhaps, that this information, which is stated to be entirely inaccurate, was not conveyed to the signalman, as this would have authorised the east cabin signalman to do what he did, without any infringement of Rule 54.

No explanation is forthcoming as to the manner in which this error in telegraphing between York and Durham arose, but it is of the utmost importance in showing the additional necessity that exists for taking such steps as will ensure these messages being accu-cabin transmitted. The failure to convey information from Durham telegraph office to the east and west cabins, points out the desirability of sending written messages, showing how much each train is late, instead of endeavouring to attract the attention of the signalman by the mere ticking of an electric needle. This is what the telegraph clerk at Durham station, according to his evidence, attempted to do, but unsuccesfully, on the morning of the collision about eight or nine minutes before it took place.

It is now necessary to trace the progress of the down Scotch express train which left York at 1.8. a.m., or eight minutes late. It consisted of an engine and tender, nine carriages, and two break-vans, with a guard in each, one next the tender and the other at the rear of the train. It is said to have approached Relly junction when travelling at about its usual speed at that place, without any attempt to make up for lost time, and there is no question that the Relly junction signals were taken off for this train to proceed.

The signalman on duty at Relly junction, Hickson, stated that he received the signal "train on line" from Burnigell, the next telegraph station to the south, for the Scotch express at 2.32 a.m., and gave the "be ready" signal and got an acknowledgement, and "line clear" immediately, in less than a quarter of a minute, from the west cabin, and he then took off the down-signals, first the *home* and then the *distant*, and the latter was off a good while before the train passed it; that he gave "train on line" to the west cabin, "four beats on the bell and two beats on the dial-signal," at 2.36 a.m., at which time the train passed his box; that before the train passed, he looked towards the west cabin and observed both the down distant and down repeating-signals (which are in sight from his cabin), and that the down distant signal was half red, half white, but more red than white, while the down repeating-signal showed a red light; and he continued to look at the down distant and down repeating-signals while the train was passing his cabin and for about a distance of 100 yards, and did not see the signals altered.

He also stated that when he telegraphed to the west cabin he usually got an answer in a quarter of a minute, and he denies having received any telegram from Durham or any other place, as to that train, on that night. This is at variance with the evidence of the telegraph clerk of the Durham station, who stated that he telegraphed to Hickson, and received an answer from him at 2.29, and produced his book to support his statement.

The driver, fireman, and the two guards of the Scotch express all stated, that the down distant and down repeating-signals were both off as they approached them after passing Relly junction.

The driver stated that he had been an engine-driver 28 years, and 20 years of that time in the service of the North-eastern Railway Company, and had driven the Scotch express for 10 years, and that he was travelling about 25 miles an hour when he approached Relly junction, where he shut off the steam; and at the repeating-signal (where they become visible) he saw a good red light on the upper or platform down home-signal, and a very dim light on the lower or the main down home-signal, above the west cabin, and he told the fireman to put his break on tighter. That the down home-signal looked more like a *dim* white light than a red one, and he watched it all the way, and when he was about 50 yards from the west cabin he saw that it was a dull red light, and he told the fireman again to put on the tender-break tighter, and he then whistled with the break whistle, applied the engine-break, reversed his engine, turned on the steam the reverse way when half-way down the platform (which is 200 yards in length), and he was sure that his speed was not more than 10 miles an hour when the collision took place.

The fireman supported the driver's statement as to the nature of the light at the down home main-line signal, and he also stated that his break was tight on as they came to the down repeating-signal, and also as to their not making out that it was a dull red light until they were within 50 yards of it.

Neither of the guards observed the down home-signals at the west cabin after seeing that the down distant and repeating signals were off, until their attention was called by the driver whistling; and then, when 40 or 50 yards from the west cabin, the head guard, riding in the van next the tender, saw that both signals were on, and that the down home-signal for the main line was dim, and from that time the accident was all over in a minute. It happened while he was putting his break on, and he got a good shaking, and he thought they were going about 21 or 22 miles an hour when the collision occurred at 2h. 37m. by his watch.

The 2nd guard confirmed the [illegible]'s statement. The driver and 2nd [illegible] the collision occurred at 2h. [illegible] leaving York and [illegible] the head guard [illegible]

of speed at which the Scotch express was running between York and Durham was, as near as possible, the average rate at which the train must run to keep time between York and Newcastle,—46 miles an hour.

Since our inquiry the coroner for the Chester ward, in the county of Durham, has been good enough to supply us with copies of the depositions of the signalmen of the west and east cabins, taken before him at the inquest.

From these it appears that the signalman at the west cabin then stated that he had no clock in his cabin, and in consequence kept no time book; that he received from the Relly junction signalman the "be ready" signal for the express, and acknowledged it; that he gave the "be ready" signal to the man at the east cabin, and he immediately gave the shunting-signal; then the Relly junction signalman gave him "train on line;" and instantly he saw the train coming out of the cutting which is close to the repeating-signal; that he never heard the driver whistle until he got half-way through the station, when he gave three sharp whistles.

That he never pulled the lever over at all, so that the back (or distant and repeating) signals ought to have been on, as they were on when he got the shunting-signal, and had been on for about an hour, and he never took them off because the man at the east cabin did not take his control off the west cabin signals; that after the collision he saw a portion of a white light at the entrance to the cutting, which made him suppose the signals were not quite right. That he had never looked to observe that before that night, and had to go out to the bridge to see the position of the white light.

It should here be mentioned that the back light at the repeating-signal could be seen from the cabin without going out on to the bridge.

He also stated that when he returned after the collision he found that the signals were only half on, that the wire might stick, which it has frequently done before; and the furthest signal (the distant) has been working badly for some time past; that both the home-signals were showing good lights and quite clear.

He further said that he had known shunting at the east cabin between the time the express was due and its arrival.

The statements of the signalman at the east cabin was that the light engine arrived at Durham at 2.34 a.m., and he secured the line for shunting by placing the signals at stop (danger); that he moved the requisite levers to enable the light engine to cross from the up to the down main line, and thence into the Newcastle dock; that as the Scotch express had not been reported to him that night he pulled the signal off as usual when the train is not reported, and set the points for the driver to go into the Sunderland dock; that after the light engine and train had got out on to the main line he received the "be ready" signal from the west cabin, which he did not acknowledge; and a short time after receiving that signal he observed the express passing the west cabin, and he shouted out to the driver of the light engine to jump, he having been slow in getting his train off the main line; that after the express had got half-way through the station, that is, between the west and east cabins, the driver whistled three sharp whistles for the guards to apply their breaks; that he heard the fireman speak to the London guard and say, "Was not those distant-signals off?" and the London guard said, "Yes;" and the fireman replied, "That's what I say."

This signalman also stated that he had no telegraphic communication that night of the express train; that had he had communication that night of the [illegible] train, the other train would not have [illegible] to shunt, as the express is sometimes [illegible] late.

[illegible] collision was to throw the Scotch

express train engine, tender, break-van, and the carriage (a third-class) next to it, all off the rails, and the van and the third-class carriage were knocked into each other. The passenger who was killed was riding in this carriage, and some considerable time elapsed before she could be extricated. Every vehicle in the Scotch express was more or less damaged; and a statement of the damages to the vehicles, given in the order in which the train was formed up, is annexed.

As regards the light engine and train of empty carriages, it is stated that the engine requires new tank end and new buffer; that the van and composite carriage were both destroyed, and the third-class carriage had one quarter taken out.

The station-master (Mr. Page) at Durham was not on duty at the time of the collision, but as he lives on the premises he was called up and got to the scene of the accident a little before 3.0 a.m.; and some of the injured passengers were taken into his house and were supplied with tea and such refreshments as he could offer.

He had given charge of the station to an acting station-master, a guard of a passenger train (Cole), (who had performed similar night-duty for five months, a year and a half before) about 7 p.m., but he did not leave the station until nearly 9 p.m. This acting station-master had come on duty on the evening of the 4th November, at 7.0 p.m.; he was away from his duty 25 minutes, about 8.0 a.m. on the 5th, for breakfast, 40 minutes for dinner, about 1.0 p.m., and 1¾ hours between 5.0 and 7.0 p.m., when he took charge of the station when requested to do so by the station-master. But these long hours were caused by an accident at Chester-le-Street station, which is about six miles from Durham, and they do not appear to have contributed in any way to cause this collision.

It was stated by the general passenger superintendent (Mr. Christison) that the east cabin signalman should apply to the chief officer on duty at the station for permission to shunt before allowing it to be done; but the station-master (Mr. Page) said that the east cabin signalman does not come to ask his permission for shunting, either day or night; but if there is any unusual shunting he is told what to do. That night the shunting was as usual—to shift the train of empty carriages from one siding line into another—so as to be ready to leave at 5.30 the same morning; and the acting station-master said that his permission was not asked. The regulations do not require it.

The collision in this case appears to have been occasioned by certain of the company's servants having imperfectly carried out that which is very proper and what is stated to be the intention of the company's officers, and also the practice generally followed with regard to the working of the block system adjacent to an important station like Durham, and also in disregarding the rules that govern the shunting of trains.

1. The east cabin signalman was greatly to blame for having proceeded to shunt the light engine and carriages, when, according to his own statement, he knew nothing about the down Scotch express.

2. It is intended, as explained by Mr. Christison, that for all through or non-stopping down trains the "be ready" signal received from Relly junction by the west cabin signalman should not be acknowledged back to Relly junction until it had been sent forward to the east cabin and acknowledged from thence, thus ensuring that the whole length between Relly junction and the east cabin, or 1,889 yards, was clear for a down train.

It is unfortunately certain that these "regulations for block signalling, &c." put into the hands of a person of ordinary intelligence for his guidance, would not require that this should have been done in all cases. It may have been the practice generally, but in this instance, taking the whole of the evidence into consideration, it would appear that when the Relly junction signalman gave the "be ready" signal to the west cabin signalman, he at once acknowledged it; and (although he denies this) then pulled over the lever of the down home-signal, thus freeing the lever of the down distant and repeating-signals, and then pulled them off; that he then gave "be ready" to the east cabin, and this was replied to by the shunting-signal from the east cabin.

It must be recollected that this occurred at night, and the signalman in the west cabin possibly knew nothing of what was going on near the east cabin, and at the time he acknowledged the "be ready" signal, may not have been aware that any shunting was to be done. If, as is here presumed, he pulled off the down distant and repeating-signals before he received the shunting-signal from the east cabin, when that was given he should at once have again put them on to danger, and for not having done so was greatly to blame.

3. It is impossible to reject the evidence of the driver, fireman, and of the two guards of the Scotch express, that the down distant and down repeating signals were both off for that train to proceed, and the supposition that the west cabin signalman took them off under the circumstances detailed in the previous paragraph is a more reasonable one, than that these signals were not working properly. The line is straight to the repeating-signal, and the distance is not great for that one, at all events, to have worked properly; but the evidence afforded by the excessive damage to the rolling stock, the time occupied in running from Relly junction to the spot at which the collision took place, within a few yards of a mile in distance, and apparently in one minute of time, goes far to prove that the driver was travelling at a much higher rate of speed than the special order of Mr. Fletcher authorised: 20 miles an hour. The best explanation of what occurred between Relly junction and Durham seems to be, that the driver and fireman were deceived by finding the down-distant and repeating-signals off, and were not in consequence keeping a good look-out when the engine passed out of the cutting opposite to the repeating-signal. It is simply absurd to talk of a red light being converted into a "dim white one," and thus they did not take those immediate steps which were absolutely necessary to have avoided the collision. Had they been keeping a good look-out and not travelling at a higher rate of speed than 25 miles an hour when passing Relly junction the collision might have been avoided, as there was still a space of 753 yards to pull up in; but if, as is assumed here, that the speed was much greater, less serious results might, at all events, have been expected. On this account both these men appear to be to blame.

The ill consequences of this collision might probably also have been materially diminished, if the company had had their train fitted with continuous breaks.

To guard against similar occurrences in future the company will do well to cause their regulations for block signalling, &c. to be revised, and in so doing to diminish as much as possible the number of signals to be given with the block-telegraph instruments. A less number of signals should be ample to enable an interval of space between following trains to be preserved with certainty. Where more is required, speaking instruments should be made use of, and where it is necessary, as in this instance, and in similar cases, that "line clear" shall not be given except when two block sections are clear of obstructions, it should be distinctly so stated in those, or in special instructions, as is now done in the company's book of rules and regulations where exceptional rules for certain stations are given.

Additional precautions appear also to be required to guard against the practice of shunting trains where through or non-stopping trains are due; this can only be done by a more vigilant supervision, either by station-masters or those acting for them, inspectors, &c., and this also should be prescribed in the company's regulations.

The necessity for showing the times in the working time tables when non-stopping trains are to pass through important stations has already been referred

to, the desirability of keeping time books is admitted, and the omission, in this case, at the west cabin, was stated to be accidental: but it is difficult to understand how the fact of a clock being out of order could justify an important Company like the North-Eastern in allowing the record book to be even temporarily discontinued. None appears to have been kept at the east cabin. This seems to have been an error, as it is of the utmost importance that such records should be kept where shunting is constantly going on.

The necessity for transmitting to the signal-men correct telegraphic messages of the passage of the fast non-stopping trains cannot be over-rated, if shunting is to be done within a few minutes of their anticipated arrival.

I have, &c.,

The Secretary,
(Railway Department),
Board of Trade.

W. YOLLAND,
Colonel.

I concur in the above report.

WM. W. RAVENHILL,

APPENDIX I.

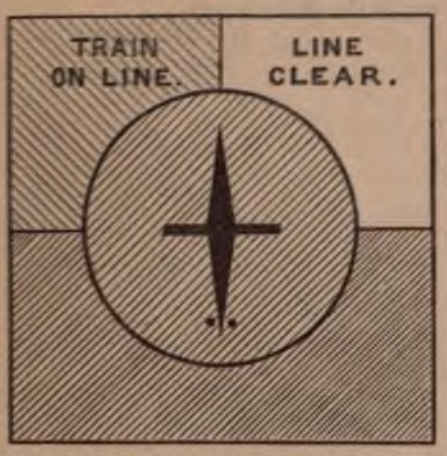
NORTH-EASTERN RAILWAY.

Regulations for Train Signalling.

by

Block-Telegraph System.

Diagram of Instrument.



1. When the instruments are not in use the handles must be kept upright, the needles will then hang in a vertical position, as shown above.

Bell Signals.

To call attention	One beat of the bell.	
Be ready for an engine or any description of train (except a passenger train)	Two beats	"
Be ready for a passenger train	Three "	"
Train on line	Four "	"
Shunt train for following train to pass	Five "	"
Stop and examine train	Six "	"
Signal given in error — Up line	Eight "	"
Signal given in error — Down line	Nine "	"
Testing	Ten "	"

Dial Signal.

Express or special passenger train on line	Two beats of needle to left.
Ordinary or excursion passenger train on line	Three " "
Express goods, fish, or cattle train	Four " "
All other kinds of trains	Five " "
Light engine	Five to the left and two to right.
Shunting	Six beats of needle to left.
Caution	Seven " "
Line clear of train or engine	Two beats of needle to right.
Line clear of shunting	Six " "

2. The process of signalling a train is as follows :—For the purpose of illustrating the course to be adopted A, B, and C are supposed to represent three signal stations, and the process of signalling a train is as follows :—On the approach of a train to station A the signalman will call the attention of station B, and then give the signal "be ready," and station B, after having ascertained that the line is clear for the train to run upon, must repeat the signal and peg the needle to "line clear." As soon as the train has passed station A the signalman there must give the bell signal "train on line," upon which station B signalman must acknowledge the signal and unpeg the needle. Station A must then indicate to station B the kind of train that is approaching by giving the proper dial signal, which station B must acknowledge by repeating it, and having received the intimation that his acknowledgment is correct by station A holding the needle over to "train on line," he must peg it in that position, and then call the attention of and give the signal "be ready" to station C. As soon as the train has passed station B it must be signalled in a similar manner to C, who must, in like manner forward the signal "be ready" to station D, and so on throughout the block. When the train has passed station B the signalman at B must call the attention of station A, and give the proper signal, indicating that the line is clear of the train, which must be duly acknowledged by station A.

3. All signals must be acknowledged by repeating them, and no signal must, under any circumstances, be considered as understood until it has been correctly repeated to the sending station. When a signal is not promptly acknowledged it must, except in the case of the signal "be ready," be repeated constantly until it is.

4. If the line is not clear at the time the signal "be ready" is received, the signalman on duty must not repeat the signal, or acknowledge it in any way, until the line has been made clear, and after having pegged the needle to "line clear," the line must not, under any circumstances, be allowed to be fouled until the train for which the signal "be ready" has been given has passed the section signal cabin. When the signal "be ready" is not promptly acknowledged, it may be given again at short intervals.

5. No train must be allowed to pass or start from any station or junction where the block system is in operation, nor any obstruction of the line be allowed to take place, without the signals having been previously duly made and acknowledged as herein directed.

6. Immediately upon an engine or train passing a block station, the home-signal must be placed at stop, and remain in that position until the signal "line clear" is received from the advance cabin : it may then be lowered for a following train to pass.

7. The line must not be considered clear, and the signal "line clear" must not be given until after the last vehicle has passed the section signal cabin on its way in the next section; except at stations where special instructions to the contrary have been issued, and during foggy weather and snow storms.

During foggy weather and snow storms, the line must not be considered clear nor the signal "line clear" be given until the engine or train has been shunted into a siding clear off the main line, or is continuing its journey in the next section, having passed the advance semaphore signal where such signal is provided, or where there is no advance semaphore, having passed the section home-signal 300 yards.

The rear section may be considered clear and a train be permitted to enter it while a train is standing under the protection of signals between the signal cabin at the other end of the section and its advance semaphore, provided neither of the trains conveys passengers.

In regard to passenger trains, the line in the rear section must always be considered blocked until the preceding train has either been shunted clear off the main line or has passed the advance semaphore where such signal is provided, or, where there is no advance semaphore, has passed the section home-signal at least 300 yards, on its journey in the next section.

In the event of a second train arriving at a signal station before the preceding train has been telegraphed as clear from the station in advance, it must be brought to a stand and properly protected by the signals, and the driver must be told to draw the tail of his train within the signal cabin, and there await further orders. Such train must not again be started until the necessary permission has been given by the signalman either verbally or by lowering the advance semaphore, where such signal is provided.

In reference to trains approaching junctions, the

principle must be strictly acted upon that trains are not to be permitted to approach a junction at the same time on sections which converge to a fouling point either by running into one line, or by crossing each other to different lines; and the opposite diagram is

given as an illustration: Whenever a train or engine is signalled as having entered section D, no engine or train must be permitted either to pass from section A to section E, or to enter section F; and whenever an engine or train has been signalled as having entered section F, no engine or train must be permitted to enter section D.

8. Signalmen must in all cases satisfy themselves that the whole of a train has passed, and that the line is free from obstruction, before giving the signal "line clear" to the station in the rear.

9. During the day time all passenger trains will carry on the last vehicle of the train a "last vehicle" or "train following" board. The guard's van will in all cases be the last vehicle on all other description of trains. By night all trains will carry the usual signals on the last vehicle.

10. Should a passenger train pass a signal station without having on the last vehicle a "last vehicle" or "train following" board by day, or tail lamps by night, or should any other train pass without having a guard's van as the last vehicle by day, and tail lamps by night, the signalman must not telegraph "line clear" to the station in the rear, but must call the attention of such station in the usual manner, and on gaining attention, must give the signal "caution" seven beats of the needle to the left hand. This signal having been acknowleged, he must again peg the needle over to the words "train on line," and give the signal "stop and examine train" to the advance station; the signalman at the rear station will thereupon stop any train following, and verbally instruct the driver to proceed cautiously towards the station in advance, informing him why it is necessary that he should do so; the signalman must then give the bell signal "train on line" and the proper dial signal. As soon as the train, the driver of which has been cautioned, has passed the signal station from whence the signal "caution" was received, the signalman there will recommence signalling in the ordinary manner.

11. Should a signalman have reason to suppose from any cause that a train which has arrived at, or passed his cabin, has left any portion of the train on the line, he must, in addition to carrying out the instructions contained in Rule 10, with respect to the line on which the train is running, stop the first train that arrives on the other line, inform the driver what has occurred, and instruct him to proceed cautiously so as to avoid danger, in the event of any portion of the train which has broken loose having fouled the line on which he is running.

Should only a light engine pass out of a section, when the signal for a train has been received, the signalman must keep the rear section blocked, and at once give the "stop and examine train" signal to the advance cabin. The signalman at the latter cabin must, after questioning the engine-driver, either give the proper bell signals that the "train on line" signal was an error, or four beats to signify that the engine has left its train on the line. In the former case, the rear cabin signalman may open his rear section; in the latter case, he must keep the line blocked, and, in addition to sending some person to inform the rear signalman the reason of his doing so, must caution the driver of the first train which enters the section on the other line.

12. The signal "stop and examine train" is only to be used in the event of a signalman observing anything unusual during the passage of a train past his cabin, such as a vehicle on fire, a shifted or loose load, a broken axle, or any train without the signals or guard's van as required by Rule 9. Any signalman receiving such signal must immediately exhibit the necessary signals to stop the train, which must, on arrival, be carefully examined, and dealt with as occasion may require.

13. Before obstructing the line by shunting or otherwise, protection must be secured as follows:

The signalman at whose station the shunting has to be done, must, after giving the signal "call attention" in either or both directions as may be necessary, and received its acknowledgment, give the dial signal, "shunting," upon which, after acknowledgment, the signalman at the receiving station must hold the needle to "train on line," in which position the signalman at the sending station must peg and keep it until the shunting is over and the line clear, when he must give the signal "line clear of shunting," and receive its acknowledgment.

14. The signalmen on giving a signal must see that their needles are firmly and completely blocked over; and when the needles are blocked over at the opposite end of the block, they must see that the handles of their instruments are perfectly upright; the pegs must not be placed in the handles, except when required for the purpose of pegging the needles over.

15. After a section has been put in block, the needle must not, under any circumstances whatever, be unpegged until the train has passed the station to which it has been signalled, or the bell signal has been received intimating that the signal was given in error.

16. The needles and bells must not be worked quickly, but each movement must be made slowly and distinctly.

17. The block instruments must not, under any circumstances, be used for conversing.

18. Guards must not rely upon the telegraph in case of stoppage, but must go back with signals and protect their trains, as required by the general regulations of the Company, this duty being performed by the rear guard when there are two or more guards with the train, and he must in all cases go to the next signal station in the rear, and with the least possible delay inform the signalman on duty of the stoppage. If a train is afterwards allowed by the signalman to follow on the same line, the guard of the train which is blocking the line must ride on the engine, and point out to the driver where he left his train. The train thus following must run at reduced speed, and great caution must be observed by all concerned.

19. In the event of any failure of the instruments or bells, so that the necessary signals cannot be forwarded and received, no train must, under any circumstances, be allowed to pass a signal station and enter upon that section of the line where the failure exists, without having been previously brought to a stand, and the driver and guard informed of the circumstance. When this has been done the driver must be instructed to proceed cautiously to the block signal station in advance.

20. Signalmen are requested to note that in the event of either of their distant-signals failing during the night, they must, before going to trim or relight them, block the line in both directions, except at those stations which are supplied with a switch; in these cases the signalmen must first call the attention of the signalmen on either side and give the usual testing signals, and upon their acknowledgment turn on the switch, lower the signals to "all right," and then go and do what is necessary to the lamps. This does not apply to stations where a boy is employed to attend to the lamps.

21. To prevent delay to "break down van" trains when out upon the line, they must, in all cases, be signalled on the block telegraph system as "express passenger trains."

22. All the signals as received and forwarded must be entered at once in the proper column of the signal book. When the exact time is under half a minute, the half minute is not to be counted, when half a minute or more, the time is to be recorded as a minute; thus, a signal at 30¼ minutes must be counted as 30 minutes, and a signal at 30½ or 30¾ minutes as 31 minutes.

23. Testing signals.—The first thing to be done by a block signalman when commencing duty in a signal cabin which has been closed during the night, must be to test his signals with the corresponding signal station in both directions, and an entry of the time the testing signals are sent and acknowledged must be made in the book at both cabins; and upon leaving duty at night, he must also give the test signal in both directions, and these signals must be recorded in the same way as the morning signal. If there is any defect in the working it must be noted in the book, and atonce reported by the signalman to the station-master, who must send word to the telegraph line inspector with the least possible delay.

HENRY TENNANT,
York, April 1st, 1873. *General Manager.*

APPENDIX II.

STATEMENT of the Nature of the Damage done to the vehicles in the down Scotch Express Train by the Collision at Durham on the 6th November 1873.

Engine, No 703.

New smoke-box, one new steam-pipe, two new fore-end axle-boxes, two new weigh box carriages, one new break carriage, two new motion bar supports, one new motion block and new buffer beam, one new leading spring, two new lifting links and the following repairs, leading spring harness bent, crank shaft bent, frame end bent, cylinder flange broken, chimney knocked in.

No. 84, L. B. van E.C.J.S.

End of body, corner pillars, arch rail end bar, roof, cornice, castings and corner plates, floor, one quarter, stepboards and irons, buffer rods, draw-bar, coupling, one light, handles, body bolts broken, head stock damaged, body and carriage ironwork bent and disarranged.

No. 74, Composite E.C.J.S.

One end of body, including corner pillars and end bar, one arch rail, one bottom bar, panels and battens at other end, two doors, one quarter, three lights, roof, three castings and corner plates, buffers, draw-bar, stepboards, and irons under carriage broken, body and carriage ironwork bent and disarranged.

No. 1,430, Third-Class G.N.

End of body, one corner pillar, one quarter, nine handles, castings, corner plates, buffers, one diagonal, drawbar, body bolts, step irons, roof, cornice, and two headstocks broken, body and carriage ironwork bent and disarranged.

No. 36, Composite E.C.J.S.

Two panels, eight handles, roof and pulleys casting, corner plates, buffer, stepboard and irons, body bolts, door hinges, and corner pillar broken, body and carriage ironwork bent and disarranged.

No. 77, Third-Class Break E.C.J.S.

Three lights, cornice, pulleys, one handle, body bolts, one corner pillar, castings and corner plate, stepboard and irons broken, body and carriage ironwork bent and disarranged.

No. 1,379, Saloon G.N.

Six panels, inside divisions and door, handles, roof, cornice, pulleys, two stepboards and irons, body bolts broken, carriage ironwork bent and disarranged.

No. 18, Saloon G.N.

One large side light, frame and bonnett door, three handles, one inside door, roof, cornice, and pulleys, one casting and corner plate, spring, stepboard and irons, body bolts, carriage ironwork bent and disarranged.

No. 23, Composite E.C.J.S.

Two castings and corner plates, body bolts, lamp irons, and one draw-bar broken, carriage ironwork bent and disarranged.

No. 35, Composite E.C.J.S.

One casting, corner plate, and body bolts broken, body knocked on one side, carriage ironwork bent and disarranged.

No. 41, Third-Class E.C.J.S.

Castings, corner plates, axle-boxes, bottom side, end of body, end bar, roof, cornice, body bolts broken, body knocked all adrift, body and carriage ironwork bent and disarranged.

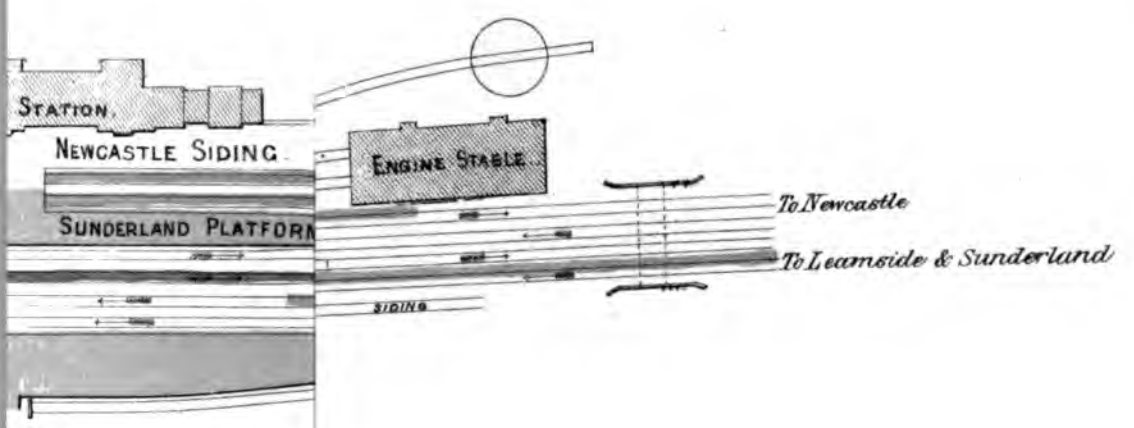
No. 83, L. B. van E.C.J.S.

Castings, corner plates, one glass, body bolts broken, carriage ironwork bent and disarranged.

To accompany Report of Enquiry into the Collision on the 6th November at the Durham Station

H EAS

DURHAM



Express travelled ..... colored Blue.
Shunting Engine travelled Do. Red.

Vincent Brooks Day& Son Lith.

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE,
DATED THE 28TH JANUARY 1874,

INTO THE CIRCUMSTANCES ATTENDING THE COLLISION ON THE

NORTH BRITISH RAILWAY,

WHICH OCCURRED AT

BO'NESS JUNCTION,

On the 27th January 1874.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

[C. 934.—V.] *Price* 10*d*. 1874.

THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE, DATED THE 28TH JANUARY 1874, INTO THE CIRCUMSTANCES ATTENDING THE

Collision on the North British Railway, at Bo'ness Junction, on the 27th January 1874.

SIR, 1, *Whitehall, 25th February* 1874.

I HAVE the honour to report, for the information of the Board of Trade, in compliance with the instructions contained in your letter of the 28th ultimo, the result of the formal investigation into the causes of, and the circumstances attending, the terrible collision which occurred on the 27th January between an express passenger train from Edinburgh to the north of Scotland, and a train of mineral waggons which was being shunted from the sidings at one side of the line to the sidings at the other side, at Bo'ness junction on the Edinburgh and Glasgow section of the North British Railway.

I regret to state that 14 passengers and the driver of the express train were then instantaneously killed. Two other passengers received such severe injuries that they subsequently died. The fireman of the express train engine was very severely, and two guards slightly injured, and 28 passengers are stated to have complained of being more or less seriously injured, but as regards those injuries the Officers of the Railway Company state that they have no specific information.

This public inquiry was held under the provisions of the Regulation of Railways Act of 1871, with the assistance of Mr. W. W. Ravenhill, barrister-at-law, as legal assessor, in the Burgh Court Room, Linlithgow, which the Provost of that Town was good enough to place at our disposal. The sittings commenced on Monday the 9th instant, at 10 a.m., and ended at 5 p.m.; were resumed on the following day at 10 a.m. and ended at 6 p.m.; and were then adjourned until the following day to Cowlairs, near Glasgow, for the purpose of taking the evidence of the fireman of the express train engine, who was still too ill to leave his bed.

Nineteen witnesses altogether were called, of these only sixteen were examined, but the driver, Brown, who had been 30 years in the company's service, six of it as a driver, and the head guard of the mineral train, Neilson, seven years in the company's service, three as guard, and the signalman on duty at Bo'ness Junction at the time of the collision, Gordon, eight months in the company's service and about two as a signalman, were recommended by their legal adviser not to give evidence, as they had already been committed by the Procurator Fiscal on a criminal charge.

Manuel station on the Edinburgh and Glasgow Railway is about 19¾ miles west of Edinburgh (Waverley station), and 2½ miles west of Linlithgow. At this place the Slamannan and Borrowstowness (commonly called Bo'ness) Railway passes under the Edinburgh and Glasgow Railway; but a short junction line connects the Slamannan and Bo'ness Railway with the Edinburgh and Glasgow Railway on the north side of the latter line, and this junction, called the Bo'ness junction, is situated nearly ¾ of a mile to the west of Manuel station. This short junction line rises by a steep incline of 1 in 59 from the Slamannan and Bo'ness Railway, and joins sidings situated on the north side of the Edinburgh and Glasgow Railway. These sidings are connected with the main down line at their western extremity and with the main up line at the eastern end of the sidings by trailing points, which are about 25 yards west of the west end of Manuel station platforms, and also by another pair of trailing points nearly midway between the eastern and western pairs of points.

The up and down lines of the Edinburgh and Glasgow Railway are also connected by a cross-over road nearly opposite the Bo'ness junction signalman's box.

There are also other sidings situated on the south side of the Edinburgh and Glasgow Railway, opposite to the sidings at Bo'ness junction, but these sidings are only connected with the Edinburgh and Glasgow Railway by a pair of trailing points joining the main down line, 60 or 70 yards east of the trailing points (on the down line) of the through road leading to the Bo'ness junction sidings.

The Slamannan Railway is also connected with these last-named sidings by another short railway, called the Slamannan Junction Railway, on the south side of the Edinburgh and Glasgow Railway, and, like the other railway, it is also to the west of Manuel station, but this junction railway is at the present time not directly used for the working of traffic, as a wooden viaduct is now being repaired and converted into a more durable structure.

A public road from Slamannan to Bo'ness is carried across the Edinburgh and Glasgow Railway by an over-bridge between the two sets of points connecting the sidings north and south of the Edinburgh and Glasgow Railway with the main down line, and the collision took place about 12 yards east of this over-bridge.

The main down line of the Edinburgh and Glasgow Railway is only protected, as far as Manuel station is concerned, by a distant-signal placed 623 yards from the lever opposite the signal-box at the eastern end of Manuel station platform, and the Bo'ness junction sidings are protected from down trains by a down distant-signal, worked from opposite the Bo'ness junction signal box, and distant from and to the east of it by 615 yards, so that this distant-signal stands between the Manuel station down signal and the Manuel station platform, and worked by the same lever and wire, there is also a down repeating-signal which stands rather more than 30 yards west of the west end of Manuel station platform, and 451 yards east of the point at which the collision occurred.

It is stated that the Bo'ness junction down distant-signal can be seen at a distance of 1,620 yards before it is reached, and the down repeating-signal at a distance of 1,857 yards; but it appeared on examination that these signals could not be well seen at such long distances, except under very favourable circumstances as regards the weather.

No home-signals are provided for either Manuel station or Bo'ness junction.

The Edinburgh and Glasgow Railway was opened for traffic in 1841, and the Slamannan and Bo'ness Railway, including the short junction line, 38 chains in length, on the north side of the Edinburgh and Glasgow Railway, in 1856.

The interlocking of points and signals had not then (1856) been introduced, and although I am informed by the superintendent of the line, Mr. McLaren, that orders to interlock the points and signals were given so long ago as September 1872, the contractor for doing the work had not up to the time of the inquiry been enabled to complete it, owing to the great pressure existing for the execution of similar works elsewhere.

It is not known at the Board of Trade when passenger stations were opened at Manuel—the upper station for the Edinburgh and Glasgow Railway, and the one on the lower level for the Slamannan and

Bo'ness Railway,—as there is no record of their having been inspected.

It is requisite to state that as a down train from Edinburgh approaches Manuel station and Bo'ness junction at about 7 a.m. the driver, when on the look-out at this season of the year, would first observe the Manuel station down-signal light, and shortly afterwards, and in succession, the Bo'ness down distant and then the down repeating signal lights.

I should also explain that the North British Railway Company, on the arrival of the 8.30 p.m. train from King's Cross, London, which is due at Waverley station, Edinburgh, at 6.0 a.m., despatches two express trains, the first at 6.30 a.m. intended for Glasgow, and the second at 6.35 a.m. for Perth; but in June and until the 8th July last these two trains were sent forward from Edinburgh as one train, but that has not been done since the 8th July, when it was determined to run them as separate trains.

The circumstances attending this collision are as follows:—A mineral train from Causeway End incline (which is situated about one mile south of Manuel station, on the Slamannan and Bo'ness Railway), consisting of a pilot engine and 12 loaded coal waggons, reached Bo'ness junction sidings at the north side of the Edinburgh and Glasgow Railway at 7.5 a.m., according to the second guard (John Anderson), and at 7.8 according to the entry in the record book kept at Bo'ness junction signal box by the signalman, and a few minutes after it got there an express down passenger train from Edinburgh passed without stopping. This train, being the 6.30 a.m. from Edinburgh, is entered as having passed Manuel station at 7.10 a.m., and an inspector of traffic for 22 years, named Cumming, stated that it passed Bo'ness junction at that time. The mineral train waited in the sidings north of the Edinburgh and Glasgow Railway until this passenger train had passed, and then it ran across the up and out on to the main down line, and was then backed into the siding adjacent to but south of the down line, for the purpose of bringing out nine waggons which were standing in this siding and transferring them to the sidings north of the up line, prior to taking them away, and subsequently to leave the 12 waggons, which the pilot engine had brought from Causeway End incline, in the siding from which the nine waggons had been taken out. The signalman on duty (Gordon), it was stated, held the points open for the mineral train to leave the sidings north of the Edinburgh and Glasgow Railway, and to go out on to the main down line, and the second guard (Anderson) held the points for allowing the waggons to pass from the main down line into the sidings south of the Edinburgh and Glasgow Railway, and when the waggons had got into the south sidings the nine waggons were coupled on to those in front by the guard in charge, Neilson, of the mineral train. The whole 21 were then drawn out on to the main down line, the signalman, Gordon, it was said, holding the points to allow them to come out, and the nine waggons were next uncoupled from the twelve waggons in front, and the second guard, Anderson, held the points on the main down line leading to the Bo'ness junction sidings, and the nine waggons at the rear end of the train were given a "kick," and they passed into those sidings. The pilot engine, with the 12 waggons still attached, were then drawn ahead once more on to the main down line, and were in the act of being pushed back along it, and thence intended to be placed in the same siding from which the nine waggons had just been taken out, when another non-stopping express passenger train came up, at nearly its ordinary speed, and ran into the mineral waggons with terrific force, at about 7.22 a.m.

This train was the 6.35 a.m. down express train from Edinburgh to Perth, which is not appointed to stop between the Haymarket station, Edinburgh, and Polmont junction, nearly 20 miles apart. It consisted of the following vehicles, arranged in the order in which they are here written, viz., tender, engine, horse-box, with two horses in it, third-class carriage Caledonian, second-class carriage Caledonian, first class carriage Caledonian, Caledonian van, East Coast composite carriage, East Coast van, with a conductor riding in the last van and a guard in the Caledonian van.

The general manager (Mr. Mason) was the first officer of the Company who reached the spot, and he stated that the immediate effect of the collision was to shatter the last mineral waggon to pieces, to tilt up the tender still connected with the engine so that it stood on end at an angle of about 50°, and rested partly against the arch of the over-road bridge and partly supported upon the débris. The road bridge was partly carried away (the arch has since been taken down), and the coals from the tender fell down on to the foot-plate of the engine and covered up the engine-driver (Robert Allan) all but his head and shoulders, and pressed him against the fire-box. The steam escaped from the boiler of the engine through the gauge-glass, which was broken.

The engine was off the rails to the left, and stood parallel to and from 12 to 18 inches from them. Partly resting upon the boiler of the engine, and partly upon a mound of earth close to the eastern side of the south abutment of the bridge, was the framework of the horse-box, and resting upon this was the second-class carriage which had been the third vehicle in the train. Immediately behind the engine, which had had its funnel broken short off close to the smoke-box, were the splintered remains of the third-class carriage, but the body had been shattered to pieces.

The first-class carriage, the fourth vehicle in the train, was off the rails to the left, and had fallen on to its left side, but the remaining three vehicles belonging to the train were still partly on the rails, and the last was not damaged.

The greater number of the passengers who were killed are stated to have been riding in the third-class carriage that was totally destroyed.

The 6.30 a.m. express train from Edinburgh to Glasgow is, according to the Company's working time-tables, due to pass, without stopping, Manuel station at 6·59 a.m., and Bo'ness junction at 7.0 a.m. It passed that morning at 7.10 a.m.

The 6.35 a.m. express train from Edinburgh to Perth is similarly appointed to pass Manuel station at 7.6 a.m., and Bo'ness junction at 7.7 a.m. Up to the time of this collision the traffic had been worked in the ordinary manner and without the assistance in any way of the electric telegraph, but since it occurred the Company have commenced to work on the absolute block system over this part of their line, being an extension of what had previously been accomplished in this respect.

The Company's rules and regulations which appear applicable and intended to govern the working of the traffic in this particular instance, and to serve for the guidance of the Company's servants, are as follows:—Nos. 56, 57, 94, 95, 213, 221, 229, 261, 270, 313, 315, and the whole of these are given in the paper marked A. But the particular rules which appear to apply more especially to this unfortunate collision are Nos. 56, 213, and 229. Rule No. 56 states that no shunting shall take place until the permission of the person in charge has been obtained. Rule 213 is an injunction to engine-men not to cross from one line to the other, or enter on the main line from a siding, without the permission of the station agent or signalman; and Rule No. 229 requires engine-men in charge of goods, mineral, or ballast trains to keep out of the way of passenger trains, and to have their trains shunted fifteen minutes *before* an express or fast train, as timed by the time bills of the Company, is due.

Now the 6.35 a.m. express train from Edinburgh to Perth, as already stated, is due to pass Bo'ness junction at 7.7 a.m., and the collision having taken place there at 7.22 a.m., or 15 minutes *after* an express train became due, it is manifest that these rules were entirely disregarded and disobeyed on this occasion.

The inspector of traffic, Cumming, stated that he was surprised at the signalman, Gordon, allowing the

after it passed he heard a crash, and then he looked at the down repeating signal and found that it showed a red light to the east; he heard no whistle before the crash, and could not say whether the steam was on or off.

The foreman of the surfacemen stated that he saw the Glasgow express pass, and after that the mineral train began to shunt at Bo'ness junction; then he went to Manuel station signal cabin, and reached there 10 or 12 minutes past 7 a.m., but he was not certain of the time; that when he passed the repeating signal, before the 6.35 a.m. train passed, it was a red light, and he noticed it again before he entered the cabin and it was red. When he was in the cabin he heard the train coming at its usual speed, and he did not do anything to stop it, for he did not know whether the signal might have been turned off or not; that he was in the cabin when it passed, and he heard the crash about a minute after it passed. This signal-box is nearly 600 yards from the spot at which the collision occurred.

The guard of the 6.35 a.m. express train (Barbour), who had been 20 years in the service of the North British Railway Company, and had acted as passenger guard for 12 years, stated that he came on duty that morning at Edinburgh at 6.5 a.m.; that he rode in the Caledonian van, the fifth vehicle from the engine, and that the train left Edinburgh three minutes late, in consequence of alterations going on at the Waverley station; that the tender was running in front of the engine, and that with that engine this was always done in running to Larbert, as the turn-table at Larbert is not large enough to turn the engine and tender together; that he had been three months running with this train, and sometimes they had this engine, No. 351, and sometimes other engines, but the engine-driver (Robert Allen), who was killed, has pretty often come on this engine; that he was generally in the habit of whistling at all stations; that they stopped at the Haymarket station, and slackened at Corstorphine and Gogar, and almost pulled up at Winchburgh; that the traffic was worked on the block system, at that time, from Edinburgh as far as Pardovan sidings (15 miles 21 chains from Edinburgh), but that he did not know the cause of the signals being on against them, but he saw them on; that nothing occurred from Winchburgh till the accident occurred; that he was not looking out before they came to Manuel, but when they reached the west end of the viaduct, near the east side of Manuel station, the driver gave a long ordinary whistle for a station, and he looked out then, and saw the Manuel station-signal clear; that he did not look for the Bo'ness junction signals, as he was satisfied with seeing the Manuel station white light, and he shut up the window of the van and thought all was right; next he was attracted by two sharp whistles, eight or ten seconds before the smash, but he could not say exactly where they were; that they were running at their ordinary speed (which is about 40 miles an hour) up to the time of the whistles, and there was no perceptible attempt to stop the train on the part of the engine-driver; that he gave a turn and a half of his break, and was thrown down by the collision and hurt in the back, but he was not rendered insensible; that he got up and got out of his van and ran back towards Manuel station and found both the lights were red; that he met Cumming, and also saw the signalman, Gordon,—it might be one or two minutes after the crash,—who was looking towards the west while he was going east, and he was between the end of the train and the signal lever.

When further questioned, he added that he knew there were other lights, but he did not look for them as he had work, the parcels, to attend to inside the van.

The conductor of the 6.35 a.m. express train (Titmus), who rode in the van at the tail of the train, stated that he had been 13 years engaged on railways, five or six years as a guard on the Great Northern Railway and the East Coast lines, and four or five months on this particular train. He had come on from London and arrived at Edinburgh at 6 a.m. He stated that the 6.35 a.m. train usually follows the 6.30 (Glasgow express), but occasionally when the London train is late they run on as a joint train to Polmont junction, where the Glasgow portion is detached. He said that they stopped at the Haymarket, and frequently slackened afterwards, especially at Winchburgh; that he saw the signals against them when they slackened, and put the break on, and supposed the Glasgow train was in front, as they were in the habit of doing; this would be the case till the Glasgow train got out of the block section on which they were running; that after they passed Winchburgh nothing occurred till the driver whistled near Manuel station; that the whistle was a long one, and appeared to be for the signal to be taken off, not for the station, and when the driver ceased to whistle he thought the signals were all right for them to proceed; that he could not say whereabouts the train was when the whistle was given; that he was down in the van arranging the parcels, of which he had many; that he heard afterwards one whistle, or it might be two sharp whistles, just at the time of the collision; that if the whistle was before the collision it was only a second before; that he had not put on his break, did not know that it was wanted, and had not time to do so; and that he was knocked down and struck in the back.

The conductor could give no useful information respecting the signals as the train approached Bo'ness junction; he said they were travelling at their ordinary speed and he felt no check till they went into the waggons.

He stated that nothing occurred during the journey to lead him to suppose that the engine-driver was otherwise than sober; that he slackened at the signals in the usual way, and that the collision took place according to his watch at 7.20 a.m.

There does not appear to be any reason whatever for supposing that the driver and fireman of the express train were otherwise than perfectly sober.

The fireman, Sutherland, of the 6.35 a.m. express train stated that he had been two years in the Company's service, and acted as fireman on that engine to Robert Allan the driver, and for that train for the first time; that the signals were against them at some stations, and they whistled and they were taken off; that as they approached Manuel station he saw that the Manuel station down signal was clear, and the driver whistled as they approached that station; that he did not see either of the signals exhibited from Bo'ness junction as he was engaged in breaking some lumps of coal as they were passing the Manuel distant-signal; after that he took the bar pricker and gave the fire a clear up; that from the time of leaving the Haymarket, the driver never sat down nor took his eyes off the signals; that he then took the shovel and put some small coal on the fire, and the driver then called out "break," "break," "that is the red signal, but it is too late;" that they had passed both of the Bo'ness junction signals at that time, but on further consideration he said he could not be quite certain that they had passed the repeating signal; that Allan sounded the whistle for the breaks and reversed the engine; that he put down the shovel and went to the break and put it on, and looked along the side of the tender, and saw the waggons, one or two trucks lengths in front of them; that he was riding on the side next the 6-foot; that he did not see what light the driver meant when he called out "that is the red signal;" that he jumped off, and was on the ground before the collision took place, and after he got on the ground he fell three or four times.

He could not say anything about the signals after the accident, as he was so injured that he was carried into an adjacent bothey, neither could he tell what had hurt him.

The driver, Robert Allan, who could have given distinct evidence as to the Bo'ness junction signals was unfortunately killed. One explanation of the occurrence, and that most in accordance with the great bulk of the evidence is, that after seeing that Manuel station down distant-signal was at "all right" he had ceased to keep a good look out, and passed the Bo'ness

D.

TABLE showing the times of the running of the trains on the Edinburgh and Glasgow Railway.

Stopping at, marked S. Passing, marked P.
Bo'ness Junction.

Description.	Up Trains.	Down Trains.	Time.	Interval of Time.	REMARKS.
			H. M. A. M.	H. M.	
Goods -	—	P.	1 00	10	
„ - -	—	P.	1 50	50	
„ -	P.	—	2 29	39	
„ - -	—	S.	2 45	16	
„ -	P.	—	3 17	32	
„ - -	—	S.	4 20	1 3	
Newspaper -	P.	—	4 47	27	
„ -	—	P.	4 47	00	
Goods -	S.	—	5 15	28	
„ - -	S.	—	5 25	10	
Mineral -	S.	—	5 40	15	
Goods - -	—	P.	5 47	7	
Passenger -	—	S.	6 29	42	
„ -	—	P.	6 46	17	
„ -	—	P.	7 00	14	
Goods -	S.	—	7 05	5	
„ -	—	P.	7 07	2	
Stores -	P.	—	7 31	24	
„ -	P.	—	7 57	26	
Passenger -	—	P.	8 12	15	
„ -	P.	—	8 46	34	
„ -	P.	—	8 57	11	
„ -	—	P.	9 09	12	
„ -	—	P.	9 32	23	
„ -	P.	—	9 35	3	
„ -	P.	—	9 46	11	
Goods -	S.	—	10 20	34	
Passenger -	—	P.	10 30	10	
„ -	P.	—	11 16	46	
„ -	P.	—	11 23	7	
„ -	—	P	11 46	23	
			P. M.		
„ -	P.	—	12 41	55	
Stores & Passenger.	P.	P.	12 49	8	
Goods -	—	P.	1 05	16	
Passenger -	—	P.	1 21	16	
„ -	—	P.	1 34	13	
-	P.	—	1 47	13	
„ -	—	P.	2 08	21	
Goods -	P.	—	2 30	22	
Passenger -	—	P.	2 34	4	
„ -	P.	—	3 03	29	
† Special -	—	—	3 10	7	
Passenger -	—	P.	3 46	36	
„ -	P.	—	4 00	14	
Mineral -	—	S.	4 05	5	
Passenger -	—	P.	4 20	15	
„ -	P.	—	4 23	3	
„ -	—	P.	4 32	9	
„ -	P.	—	5 01	29	
„ -	—	P.	5 46	45	
„ -	P.	—	5 50	4	
Goods - -	P.	—	6 00	10	
Passenger -	—	P.	6 33	33	
„ -	P.	—	6 34	1	

* Omitted in return. † When required.

Description.	Up Trains.	Down Trains.	Time.	Interval of Time.	REMARKS.
			H. M. P. M.	H. M.	
Passenger -	—	P.	6 46	12	
Stores -	—	P.	6 47	1	
Passenger -	—	P.	7 00	13	
Goods -	P.	—	7 22	22	Saturdays only.
„ - -	—	P.	7 32	10	
„ -	P.	—	8 05	33	
Passenger -	—	P	8 10	5	
Goods - -	P.	—	8 16	6	
Passenger -	—	P.	8 41	25	
„ -	P.	—	8 57	16	
Goods -	—	P.	9 10	13	
Passenger -	P.	—	9 17	7	
„ -	P.	—	9 46	29	
„ -	—	P.	9 47	1	
Goods -	P.	—	10 14	27	
„ -	P.	—	10 26	12	
„ -	P.	—	10 56	30	
„ -	—	P.	11 16	20	
„ -	P.	—	11 26	10	
-	—	P.	12 06	40	
„ -	—	P.	12 29	23	
„ -	—	S.	12 50	21	

E.

ABSTRACT of Statement of Block-Telegraphs in operation on North British Railway.

Date brought into Operation.	Number of Sections.	Number of Miles.	
		Miles.	Chains.
Previous to 1867, May	16	25	31
December 12	1	1	73
1868, January 17	6	13	53
„ 20	1	3	30
March 1	15	22	12
May 22	9	3	26
1869, September 12	2	—	76
October 17	1	3	73
1870, February 3	5		47
November 9	1	1	63
„ 10	1	2	52
„ 23	10	8	19
December 10	7	13	35
1871, April 6	1	1	59
June 8	2	5	68
October 26	4	1	71
1872, January 12	1	1	53
March 17	2	3	9
June 23	4	6	47
September 13	1	2	44
December 8	2	1	18
1873, March 9	2	10	23
April 13	1	—	42
September 15	1	1	3
November 3	6	29	27
1874, January 26	3	1	61
February 4	3	5	57
„ 8	3		4
Total - - - -		193	56

F.

List of KILLED at Bo'ness High Junction, 27th January 1874.

1. Francis Hastie.
2. John Ross.
3. James Leslie.
4. William Singer.
5. Betsy Robertson.
6. Mrs. Phemister.
7. Margaret Phemister (8).
8. John Phemister (4).
9. Andrew Dickson.
10. John Cairns.
11. Robert Allan.
12. Mrs. Tennant.
13. William Trotter.
14. Gilbert Robertson.
15. George Geddes, injured, *since* dead.
16. Miss Lydia Wilson.
17. Miss Lindsay.

In addition to these, about 28 persons injured, but of this the company have no specific information, and this is the number of persons who have complained, but the company have not the means of stating whether these complaints are justified by the facts.

G.

STATEMENT of PLANT DAMAGED at accident, Bo'ness Junction, 27th January 1874.

No. 351. Tender.—Tank plates staved in at the end and about four feet on each side. Buffers between engine and tender broken; also the buffer spring. Trailing spring links broken and carried away. Lamp sockets carried away.

No. 351. Engine.—Smoke box front staved in. Chimney destroyed. Blast pipe broken off. One spring link broken. Training axle bent. Weather board damaged. Hand-rail damaged on right hand side.

No. 71. Horse-box, North British Company.—Entirely destroyed.

No. 459. Third-class, Caledonian.—Entirely destroyed.

No. 66. Second-class, Caledonian.—Framing very much broken, and one end of body of carriage broken in and very much shaken all over.

No. 78. First-class, Caledonian.—Body much damaged on one side, one end damaged, and one footboard broken.

No. 82. Break-van, Caledonian.—Body damaged at both ends. One buffer rod broken. Side panes broken. Body started in joints.

No. 75. East Coast Joint Stock composite.—End staved in at top. Buffer sockets broken. Buffer rods bent. Draw bar broken.

East Coast passenger van not damaged.

Trucks belonging to the mineral train.

No. 16,095, North British waggon, destroyed.
„ 12,760, „ „ „
„ 9,569, „ „ „
„ 384, W. Black and Sons, "Traders," one end of the body and two side beams broken.

T. WHEATLEY,
Locomotive Superintendent.

H.

COLLISION at Bo'ness Junction.

The North British Railway Company,
General Manager's Office,
Dear Sir, Edinburgh, 5th March 1874.

In fulfilment of the promise made in my letter of the 20th ult. I beg leave to send you herewith copy of a letter from the Procurator Fiscal in reference to the alteration of the train record book.

I am, dear sir, yours truly,
Colonel Yolland, SAM. L. MASON.
Railway Department,
Board of Trade, Whitehall.

COLLISION at Bo'ness Junction.

Procurator Fiscal's Office,
Dear Sir, Falkirk, 3rd March 1874.

In answer to the enquiry in your telegram to my father of this date. I beg to state that it was about 12 o'clock noon, on the 27th January, when I saw the train time book, kept at Bo'ness junction.

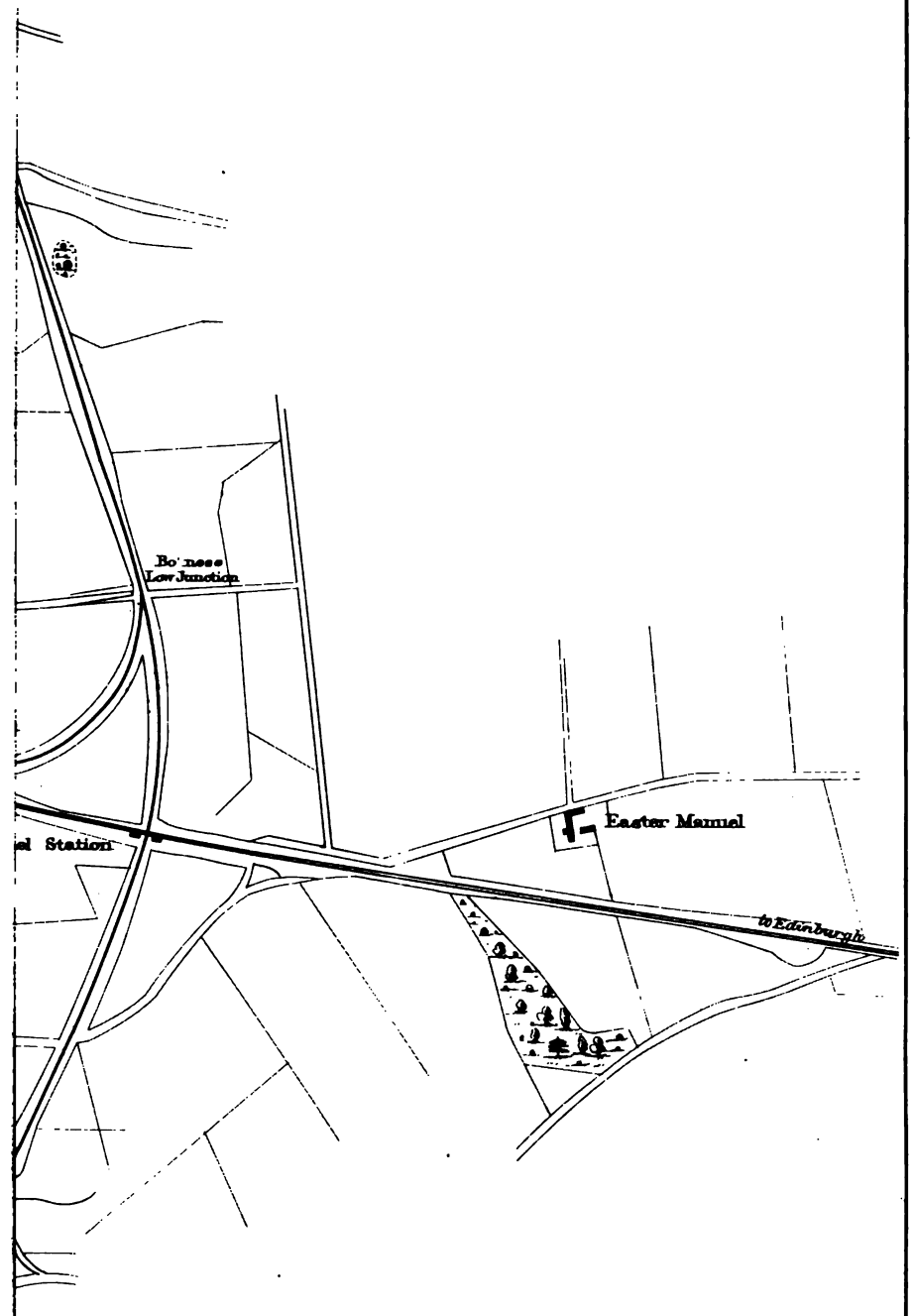
There was then no entry at all in the book as to the 6.30 train. Gordon told me he had omitted to enter it, but that it passed about 7.10 or 7.11. (I see he has since put down 7.10.)

The entry as to the 6.35 train has been altered since I saw it on the day of the collision. I *think* it was then entered as having passed at 7.14. Gordon explained that it was a good while after the collision before he had made this entry.

Yours truly,
S. L. Mason, Esq. (Signed) W. K. GAIR.
North British Railway.
Edinburgh.

Plate N°1.

To accompany Colonel Yolland's Report
Dated 25th February 1874.



SCALE.

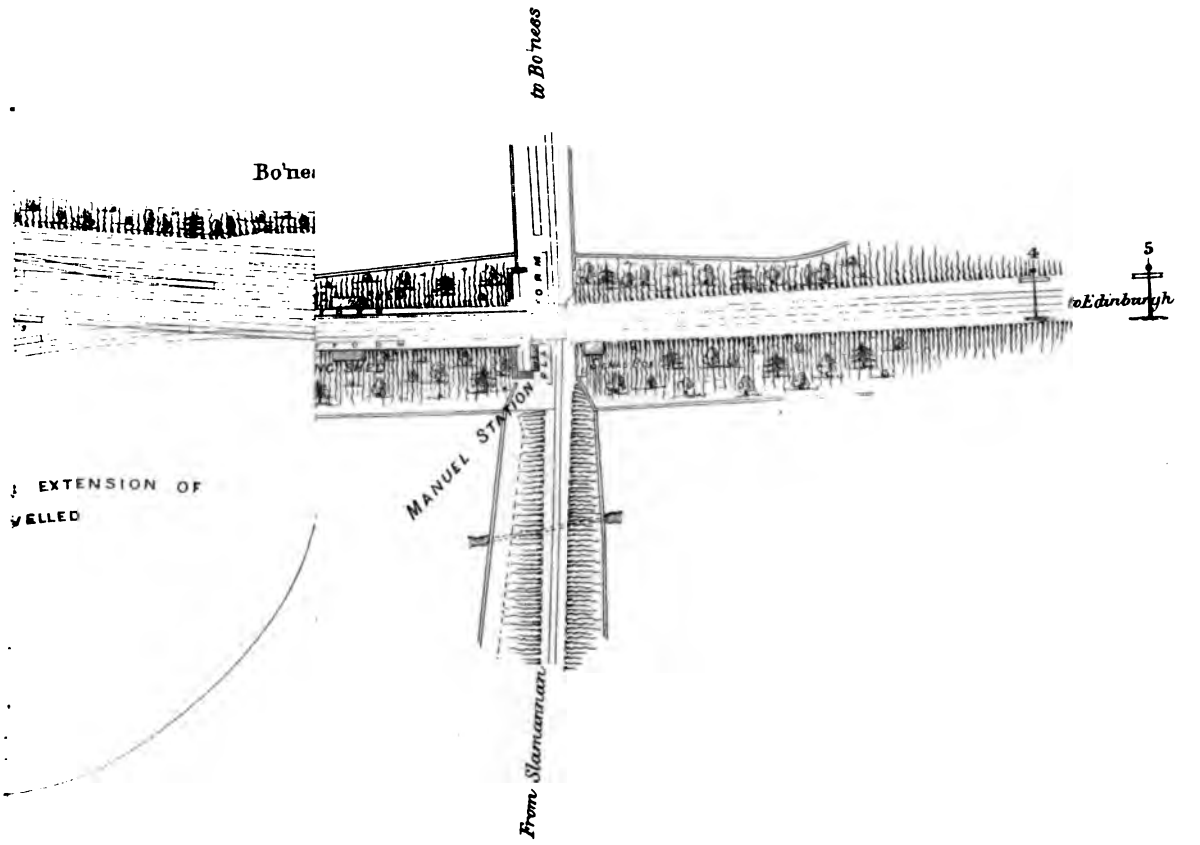
1000 500 0 1000 2000 Feet

Vincent Brooks, Day & Son, Lith

Plate Nº 2.
To accompany Colonel Yolland's Report
Dated the 25th February 1874

RAILWAY.

ND MANUEL



SIGNALS.

t Signal

peating Signal 461 yards from Point of Collision

tant Signal 720 yards from Point of Collision.

tant Signal 673 yards from Signal Cabin.

SCALE.

Vincent Brooks, Day & Son, Lith.

LONDON :
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE,
DATED THE 26TH FEBRUARY 1874,

INTO THE CIRCUMSTANCES ATTENDING THE COLLISION ON THE

LONDON AND NORTH-WESTERN RAILWAY

AT

EUXTON JUNCTION,

On the 20th February 1874.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

[C. 960.] *Price* 1*s.* 2*d.* 1874.

THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE, DATED THE 26TH FEBRUARY 1874, INTO THE CIRCUMSTANCES ATTENDING THE

Collision on the London and North-Western Railway which occurred near the Euxton Junction on the 20th February 1874.

1, *Whitehall*,
24th March 1874.

SIR,

IN compliance with the instructions contained in your minute of the 26th ultimo, I have the honour to report, for the information of the Board of Trade, the result of the inquiry which has been held by Mr. Ravenhill and myself into the circumstances of the collision which occurred on the 20th ultimo, near the Euxton junction, on the London and North-Western railway.

Besides the solicitors and officers of the Company, Mr. J. S. Darlington, the Deputy Coroner for Wigan, and Mr Cordwell, the Secretary to the Amalgamated Society of Railway Servants for the Lancashire District, assisted at the inquiry.

In this instance, the 8.40 p.m. passenger train from Euston station, London, known as the limited-mail, whilst approaching the Euxton junction in a dense fog, came into collision with a coal train standing on the main line. The engine-driver and fireman of the limited-mail have died from their injuries, and 12 passengers and a guard are reported to have been injured.

Description.

The Euxton junction is 9 miles and 947 yards on the north of the Wigan station, and between those places the block system of working was brought into operation on the 26th January 1874, under instructions which are given in the appendix. There are, as will be seen from those instructions, 10 intermediate block signal-cabins, of which two are used by day only, and which are at distances apart varying from 528 yards as a minimum to 1 mile and 1,080 yards as a maximum. The block-section cabins to which in the present report it is necessary more particularly to refer, are at the Coppull station, 5 miles and 1,232 yards north of Wigan; at the German Lane level-crossing, nearly 2 miles north of Coppull; and at the Balshaw Lane crossing, 1,130 yards north of German Lane.

The accompanying plan and section show the relative situations, and the gradients of the line in passing these and other cabins; and it will be observed that there is a falling gradient of 1 in 100 for a great portion of the distance from Coppull past the German Lane cabin.

There is a raised signalman's cabin on the south of the Coppull station platform, and the west side of the line. This cabin contains 21 levers for working points and signals, besides three discs, and a wheel for opening the gates of a public-road level-crossing. There are also block-instruments applying to the up and down lines in each direction, and a speaking-instrument communicating with Wigan, Boar's Head junction, Euxton junction, Preston, and Lancaster. 833 yards on the north of this cabin is a cabin applying to Darlington's siding. The cabin at this siding is, however, in use by day only; the wires being "switched over," as it is termed, between Coppull and German Lane for night working. The German Lane crossing is one mile 890 yards on the north of the Darlington-siding cabin. The Balshaw Lane crossing is, as already stated, 1,130 yards on the north of German Lane, and the Euxton junction cabin is again one mile 392 yards on the north of Balshaw Lane.

The down distant-signal from the German Lane cabin, 1,079 yards on the south of it, is situated on the top of the western slope of the cutting; the lamp being 38 feet above, and 43 feet horizontally from the rails. This signal, though placed, perhaps, as well as it can be for affording a view over a bridge on the south of it, to an engine-driver approaching it in clear weather, is by no means so well placed for being seen in foggy weather, and might, therefore, the more easily be missed in a thick fog.

In the German Lane cabin there are five levers,—two for working distant-signals, one in each direction,—two for working home-signals, one in each direction,—and one for working the gates of a level-crossing on the south of the cabin. There are also block-instruments for each line in each direction, and telegraph-bells, but there is no speaking-instrument. The falling gradient of 1 in 100, already referred to as passing this cabin, extends to within 257 yards of the point of collision, which was 750 yards on the north of this cabin. These last 257 yards—between the foot of the incline and the point of collision—are on a rising gradient of 1 in 660. The distant-signal south of the Balshaw Lane cabin is 314 yards north of the German Lane cabin, and is situated on the west of the line, the lamp being 17 feet above the level of the rails. The home-signal south of this cabin is also on the west of the line.

At the Balshaw Lane crossing there is also a raised cabin, containing 10 levers in a locking-frame;—of which two are spare levers,—two are used for working the wicket-gates of a level-crossing on the south of it,—one is used for a home-signal, and one for a distant-signal, in each direction,—one is used for locking the large gates of a level-crossing, which are worked by a wheel in the cabin,—and one is used for raising and lowering the stops of the gates. These levers are interlocked with one another. There are block-telegraph instruments and bells for each line in each direction. The distant-signal already referred to is 810 yards, and the home-signal is 37 yards, to the south of the cabin.

The cabin at the Euxton junction it is not necessary to refer to in detail; but some distance on the north of that cabin there is another cabin, called the "machine cabin,"—a weighing-machine; and there is a siding between that cabin and the main line, employed both as a weigh-siding and a shunting-siding. This siding joins the main line by a cross-over-road on the south of it, and there is also a cross-over-road between the two main lines opposite to the cabin. The machine-cabin is used for block-signalling purposes, and is provided with block-telegraph instruments and bells for each line in each direction.

Summary of the Evidence.

The limited mail train left the Euston station for Scotland punctually at 8.40 p.m. on Thursday the 19th of February, consisting of nine vehicles, besides the engine and tender. There was first a large double six-wheeled qreak-van, in which rode James Harrison, a guard of 17 years service with the London and North-western Railway Company, nearly 15 years as a guard, and three years (in his turn) with the limited mail. The next vehicle of the train was an Edinburgh composite carriage; then followed a post-office and two post-office tenders, one for Edinburgh and another for Glasgow. After these, there were a six-wheeled

sleeping saloon for Glasgow, a six-wheeled composite carriage for Glasgow, a six-wheeled composite carriage for Aberdeen, and a six-wheeled van, which was the ninth and last vehicle. In this rode the head-guard of the train, Anthony Johnston, who has been for 22 years a guard in the service of the Company; 17 years with passenger trains, and with the limited mail, in his turn, about every two months, ever since that train commenced running, some 12 or 14 years ago.

Johnston said they reached Stafford at 11.57 p.m., seven minutes late, after being kept by a Birmingham train outside that station for a few minutes. They left Stafford at 12.3 a.m., reached Crewe at 12.36, and left Crewe at 12.42, nine minutes late. Their next halt was at Wigan at 1.35 a.m. After stopping there five minutes instead of three, on account of post-office duty, they left at 1.40 a.m., 16 minutes late. It will be remembered that William Wolstencroft, the engine-driver, and John Timms, the fireman of the train, were so seriously injured in consequence of the collision that they died at Wigan shortly after the accident. The former had been in the service of the London and North-Western Company since 1850. In 1860 he became an extra, and in 1862 a regular driver. Both he and his fireman were men of very good character, and Wolstencroft was spoken of, as will be seen hereafter, by the officers of the Company and by his fellow-drivers, as a man remarkable for his steadiness, care, and forethought in driving.

The train passed Coppull at 1.53 a.m., and the German Lane cabin, which is 772 yards from the scene of the accident, about 2 a.m. Nothing unusual appears to have happened until about this time. For though Harrison, the under-guard, speaks of a considerable increase of speed in the train after it had passed the Boar's Head junction, and in going down the incline, yet this very thing made him think that all was right. He did not look out for the signals, trusting to the engine-driver, even though it was foggy; and he continued to sort his parcels in preparing for the arrival of the train at Preston. He added, "it was as much as he could do to sort and "prepare for the fresh lot there." Whilst so engaged he heard three sharp whistles from the engine; there was a check in the speed, and he immediately went to his break, and was able to take about a turn and a half in the two or three following seconds, before the collision occurred. There was no check in the speed prior to the whistles; they were running at 45 to 50 miles an hour. He could not describe precisely what followed; but he found himself on the other line of rails under the wreck of some vehicles. He crept out, with his ribs broken, his shoulder and legs injured, and his clothes nearly torn off his back. He was conveyed back to Wigan, and was still confined to his bed when he was examined by us.

Johnston, (the head-guard), was also engaged in sorting his parcels, when he heard something "go off like the report of a cannon." He confirmed Harrison as to there having been no slackening of speed, and as to the rate at which they were travelling. He was knocked down and a little injured, but he had not been off duty; and he was fortunately able to take immediate action in protecting his train, visiting the German Lane signal-cabin, and assisting those injured.

In the post-office vehicles nine letter-sorters were travelling, six of whom, viz., Edward Bedford, Thomas James Way, John Coales, Thompson Dane, William Williams, and John Morton, were able to give evidence. All of them had travelled for several years, some for very many years, by this train. They substantially agreed with the above statements, especially as to the whistling of the engine having occurred only just before the collision. They described it as a whistle, followed by a few seconds of cessation, during which some of them were turning round to resume their work; then it recommenced, and the accident immediately followed. There was no time, Coales said, for the breaks to make any impression on the speed.

The coal train into which the limited mail thus unhappily dashed was running from Spring's Branch to Carnforth. It appears to have left the former place about 12.20 a.m. on the 20th of February, instead of 11.15 p.m. on the 19th, the time appointed for it to start. It was driven by George Lowe, who had been six years in the service of the London and North-western Railway Company. He stated that he passed Wigan about 12.24, and left Coppull about 1.25. (The Coppull signalman said it reached him at 1.8 a.m. and left at 1.25 a.m.). The train consisted of 38 waggons loaded with coal, and a break-van, besides the engine and tender. He approached the German Lane distant-signal at the rate of about six miles an hour, and could not see it till he was directly under it. The lamp appeared to show a white light—as seen, perhaps, between the lamp and the glass. He could not see any red light from it at all, nor tell exactly whether it was on or off. He could not see it from a greater distance because it was so foggy; and the signal was not, he thought, in a good position for being seen when it was foggy, though prominent in clear weather; but he had not had occasion to notice it in a thick fog before, since it had been put up, five or six weeks before the accident. At Coppull that night he thought a light might have been seen 50 yards, but at German Lane not more than 10 yards, and the further he went into the valley the thicker the fog became. From Darlington's siding to German Lane it was a thick stationary fog. Over this portion of the line they had the break on all the way. When he was within five or six yards of the German Lane home-signal (the first time he could see it) he found it at "danger." They were then going about two miles an hour, and he pulled up opposite the Balshaw Lane distant-signal. Then he proceeded slowly, and pulled up again under the Balshaw Lane home-signal. Fifteen or twenty minutes afterwards (the line in front of him being still obstructed by a goods train) he heard a train whistle from behind. Thinking it might be the limited mail, he began to move on (with a view of avoiding a collision if possible), but he had not advanced more than four or five yards before the limited mail ran into the tail of his train. The fog was still as thick as it had been at German Lane. He said he had no instructions as to what to do after breaking the block, which he had done on this occasion,—having passed the German Lane home-signal at danger, with the line obstructed in front of him.

Benjamin Grundy, his fireman, confirmed his statements as to the condition of the fog, and as to the appearance of the German Lane distant-signal. They could not tell whether it was on or off; they could just see the glimmer of a white light when they were underneath it. They took it for a doubtful signal, and passed it at a speed of eight or nine miles an hour. The German Lane home-signal they could not see till within an engine's length of it. After standing there for half a minute they proceeded forward at a walking pace, till they got to Balshaw Lane. It was foggy all the way.

The guard, Thomas Yates (two years and four months in the company's service), gave corroborative evidence. In regard to the German Lane distant-signal he said, "I noticed it as I passed under it; I had "slightly applied the break before, and stood at the "break-handle, looking out for the signal. I saw "what I thought was a white light, but I could not see "it for many yards, till I was almost under it." He then gave a similar account of their proceeding to Balshaw Lane; he said, "I went forward to that cabin, "and had left it, and was going back down the train, "and had got six or seven waggons' length from the "engine when the collision occurred. I believe our "train was standing still for 20 minutes before the "collision. I did not go back to protect my train be-"cause I was not required to do so; there is a rule* "which says it is unnecessary, the absolute block "system being in force there. I considered I was "under the protection of the fixed signals."

Immediately in front of this train was the 5.30 p.m. goods train from Bushbury for Carnforth. The

* This rule will be found at the end of the Appendix.

engine-driver was William Gardiner (three years in the Company's service). He had stopped at German Lane just before the arrival of the coal train, because the signals of that place were both against him. He said, "It was quite clear as I approached German Lane "distant-signal, but it only showed half a light, and "I could not see it for more than 150 yards; it showed "red. The lamp was burning dimly, but the home- "signal showed a very good light." There he halted from 12.55 a.m. to 1.28, and complained, as he stated, to Burrows, the signalman, of the badness of the signal-light. This the latter denied, as also that he had told Gardiner at 1.20 that the limited mail was telegraphed. He added that Burrows also said there had been a bother about "the limited a week before, and there was likely to be a bother again." Burrows appeared to be terrified that he was bound to stop the limited mail. At 1.28 they went on, the line being cleared at Balshaw Lane. It was clear, and they could see a train at Balshaw Lane from the German Lane distant-signal. Whilst standing at the former place, about 1.35, the fog came on very thick. Gardiner then went on to say, "I was standing with my engine a few "yards beyond Balshaw Lane home-signal, when I "heard the limited mail whistle for the breaks. I "started forward, and had got about 12 waggons' "length ahead before the accident. I heard the "break-whistle sounded about four times. It seemed "to me that the driver of the limited had not seen any "signals until he came to the German Lane home- "signal or Balshaw Lane distant-signal. I could hear "very plain. I was 'harking' for him, for it was very "foggy, and the German Lane distant-signal gave a "very bad light; so I thought there might be a "collision, as it is difficult to 'twig' the exact position "of a signal in a thick fog. My train was 12 or 13 "waggons' length from the coal train when the col- "lision occurred, and was not struck." This train was about 2½ hours late on reaching Balshaw Lane, and should have reached Carnforth and shunted before "the limited" left Coppull, though they had sometimes shunted for it at Warrington.

John Kitchen, the fireman, said "they could not see "the German Lane distant-signal light from the top "of the bank as they approached, where they usually "did; it was burning dimly." He corroborated the driver as to their having complained to Burrows of the state of it. As regards the state of the atmosphere he said, "It became foggy about 10 minutes before the "limited came up. It had previously been clear. I "heard the driver of the limited whistle about four "times for the breaks. We had expected it to come "for some time. My mate had said he should be "ready to make a dart. We thought he might run "into us, and wished to be on the safe side. On "hearing the whistle we went forward about 17 "waggons' length. It was then very foggy."

Cuthbert Harrison, the guard of this train (between four and five years in the Company's service), stated that the German Lane distant-signal lamp was nearly out, but he could see it for about 300 or 400 yards before reaching it. The atmosphere was very clear then. Gardiner, Kitchen, and himself had talked about it when at Balshaw Lane. He was in his van when he heard "the limited" whistle, and got out, thinking there would be a collision, as it seemed so near the coal train behind them.

It will next be necessary to refer to the evidence of the witnesses who explain how the line became blocked; and how, therefore, the above goods and coal trains were detained on the approach of the limited mail train.

George May, the signalman on duty at Euxton, had been three months in the Company's service, and had previously for some time worked as a labourer with Messrs. Saxby and Farmer, the signal-manufacturers. He said he had first received his record-book on the 16th of February, and had entered on the 19th of February a goods train, he believed from [illegible]rpool, as signalled to him at 11.40 p.m., and [illegible] him at 11.43 p.m. This train was shunted into the siding to allow a Preston passenger train to pass, which it did at 11.54 p.m. The goods train started out of the siding at 11.57; and as it was doing so, through a pair of points 200 yards on the north of his cabin, he pushed over the point-lever too soon, and caused a waggon and van to leave the rails. The waggon went forward with the train out of sight, but the van was left behind, and the train was not cleared from Leyland till 5.56 a.m. He explained that he could not get this Liverpool goods train in or out of the siding at the points near his cabin, because there were empty waggons foul of his middle points, which prevented his moving them. The empty waggons had been placed there before he came on duty. Accordingly, he shunted the Liverpool train through the points 200 yards from him, and thus cleared his middle points, so that a Birmingham goods train (11.40 a.m. for Birmingham), which reached him at 1.16 a.m., was shunted through these middle points. But another train (8.4 p.m. from Manchester), which reached him at 2.11 a.m., was kept standing on the main line, as it was unable to pass the obstruction caused by the Liverpool van, and there was no room for it in the siding. This last-mentioned train stood immediately in front of Gardiner's goods train. There were thus three trains standing on the main line, besides the Birmingham train in the siding, when the limited mail came up.

The Birmingham and Manchester goods trains left the next morning at 5.57 a.m. on the line being cleared.

Pearson, the driver of the Liverpool goods train, added nothing of any importance to May's account of the line being fouled by a waggon and van of his train.

Lawrence Waring, the night-porter in charge of the Euxton station at the time of the accident, said the station-master had told him, before he left duty on the night of the 19th, to call the fog-men if necessary. The fog came on a few minutes before 2 a.m., shortly before the mail arrived,—"thick, all of a cloud"; and he was on the point of going to awake the men, when a guard told him of the collision.

With regard to the atmosphere, Harrison, the injured guard, said, "It was foggy, but I am not able to say "whether or not it was thick. I could see on looking "through my back window that it was foggy. It was "not so till we passed Warrington. In passing Springs "Branch I saw the signals above me for about "100 yards." He could give no information about the state of the German Lane distant-signal when they passed it, or the fog at that place.

Of the post-office clerks, Bedford said he noticed it was very foggy at Wigan, and they travelled slowly at first from that place, he thought, because it was so foggy. He did not notice the fog then till after the collision; when it did not appear to him to be foggy, but very dark. On getting on the up line he could see the lights of a train on that line, he should say a quarter of a mile or more off. Coales and Dane spoke of it in terms almost similar. Williams, who was the junior on duty, and handed out the bags, noticed it "foggy, but not a dense fog," at Preston Brook and Warrington; but he could give no further information about it, nor about the state of the German Lane distant-signal, as he was engaged inside the van. Morton confirmed Williams and the others. The signalman at Coppull (Edgerley) stated that it was very foggy when the limited mail passed him; and that it had been so for about four minutes previously. It had previously been very clear. It cleared again 10 or 12 minutes after the accident, and so remained for three-quarters of an hour, and then a misty fog came on till 6.30 a.m. The signalman at Balshaw Lane said, "There was "a fog a short time before the collision; it was not "very thick. I could see my home-signals, 37 yards "off. The fog came like a cloud, soon on and "soon off."

Johnston, the head-guard, said he had noticed it

hazy at Springs Branch and Wigan, and after passing Coppull he remembered seeing the fog hanging about his van windows. He appears not to have looked out again till after the collision. Soon after it happened, having been thrown down by it, he got up, and out of his van window ; then he returned for his lamp, which he could not find ; but he found some fog-signals, with which he went back to the line. The fog was very dense; it was blowing about. He could not have seen his tail-lamp above 10 yards. He added, that as a rule when he rode next the engine he told the drivers of a fog, when there was one, and to be careful. He thought they should slacken speed in a fog, and that it would have been better if Wolstencroft had done so. It was usual to do so in such a fog. But though their speed was high that night, he should not have thought it unusual if no collision had occurred ; and he should not have reported the engine-driver for going too fast. He should have expected fog signals at German's Lane if the signals had been at danger, under the circumstances of the fog which he saw after the collision. But of the state of the fog at the German Lane distant-signal when they passed it, he could say nothing, as he was busy in his van. It was a fog off and on ; in some places foggier than others. At the scene of collision the fog was moving quickly. He heard no fog-signals fired that night. Sometimes the fog came on so suddenly, that there was no time to get fog-signalmen or fog-signals.

During Johnston's examination, rule No. 210 of the company's regulations was produced, which directs "that engine-men are at all times to use great caution "in foggy weather, and specially in approaching "stations, from the difficulty of discerning the regular "signals until close upon them, and they are to be "prepared to bring their engines to a stand, should "it be required."

Harrison, the guard of the limited mail, said, as far as his experience went, he thought drivers were in the habit of running as fast when it was foggy as when it was clear, with the limited mail or any other train.

But to return to the scene of the accident. Johnston, taking his fog-signals, went back along the line. As he passed the Balshaw Lane distant-signal he found it off, in consequence, he believed, of the engine of the limited mail train having fallen over the wire by which it was worked. On reaching the German Lane signal-cabin, he told the signalman there, John Burrows, of the collision, and asked him why he had not put down fog-signals. He said he had none, and Johnston gave him two. It will be seen hereafter that Burrows stated before us that there were at the time some on his mantel-piece, and others in a box, which he had forgotten. Johnston went on to say that Burrows seemed terribly put about, and hardly to know what he said. He spoke rather sharply to him, for he was indignant with him. After this he went back to protect his train, and sent to Preston for medical and other assistance. This was so long in arriving that they took the injured and others back to Wigan. They reached Wigan about 6.35 a.m. It was stated by Bedford that nothing was known there about the accident, and they themselves had to summon the doctors. Johnston said that he then went into the travelling post-office, where the driver, Wolstencroft, whom he had known for a long time, was lying. He called him (Johnston) by his name. The latter then asked if he had seen any signals; he replied, "No, but it was a bad job."

It appeared that before this, immediately after the collision, Wolstencroft was found by Bedford, Morton, and other post-office officials, on the bank opposite the post-office, leaning against the slope of the cutting, in a state of great suffering. He was fearfully cut on the head and much scalded. He and the fireman, who was also seriously injured, were assisted into the Edinburgh post-office tender.

Wolstencroft afterwards said "it was a short notice." He asked for oil, which was sent for. He also said to Morton, "If the train had not been standing "between the distant and the main signal, I could "have stopped before reaching it." Wolstencroft at a later period said to Coales "that he had not "jumped, as he did not know they were near any-"thing ; he had nothing only the home-signal against "him." Dane added that Wolstencroft spoke of the distant-signal also, and that if it had been against him, he could have pulled up. But Williams and Coales do not appear to have heard the latter statement; and the whole of the above statements must be received with caution. Morton, the post-office sorter, who had been 14 years with these trains, said "they had "run from Crewe to Wigan that night at a less "speed than usual, he thought on account of the "fog." He was in the habit of noticing the drivers. Wolstencroft was a very careful man. He had known him for some time; he had always said to him (Morton) that he would not run in a fog.

Closely following the limited mail was a *light* engine, driven by Peter Baldwin, who said—

I am an engine-driver in the London and North-western Company's service, and have been so for three years with passenger trains. I left Liverpool at 11.15 on the night of the 19th February, with a passenger train for Wigan, to meet the limited mail there. I reached Wigan at 12.34, and, after putting my train in a siding, left Wigan *light* at 12.57. There was nobody but the fireman, Ralph Smalley, with me. We reached Coppull at 1.28, and found the distant and home-signals against us, and brought our engine to a stand a few yards south of the Coppull signal-cabin. Speaking from my engine to the signalman at the window of his cabin, I asked him "What was to do?" He said the line was blocked at German Lane. I said the limited was getting due; that I had heard at Wigan of its being 10 minutes late; that he had better shunt me or there would be another block. He said "Wait till I block the road on the other side." He took a few minutes to do so. I set my engine across to the up line, and he said as it was a cold night I had better come down to him. I went up into the cabin, but I don't know at what time. I stopped there and saw the limited mail go by at the usual speed. There was a very thick fog when we reached Coppull, but not so thick a fog when we left Wigan. It cleared while we stood at Coppull, before the limited mail passed. The only thing the signalman said to me while I was in his cabin was, that the line had been blocked for some time. I did not notice any working of the instruments or ringing of the bells in the cabin until, when I heard a bell ring twice, the signalman said that was line-clear for the limited from German Lane. That, I think, was five or six minutes before the limited passed. I don't remember the signalman making any complaint about the signalling from German Lane. I went down from the cabin, got on my engine, he took off his signals, and I proceeded about 10 minutes after the limited had passed towards German Lane. It got still clearer before I left Coppull, but it came on thick after I passed Darlington's siding. It was very thick as I passed the German Lane distant-signal. It was at danger. I came close under it, before I could see it. It did not appear to be a very good light, but I discerned that it was at danger. I looked at it when about 10 yards from it, and could first see it from that distance. I passed it at a speed of 15 or 20 miles an hour, and brought my engine to a stand at the German Lane home-signal, and the guard of the limited mail came and told me of the collision. He said he had got out of the van, and came back without a lamp or fog-signals. He appeared to be excited. The guard seemed just to have arrived at German Lane when I got there. I went up to the signal-cabin with the guard. The guard asked the signalman whether he had blocked back to Coppull, and he said "Yes." He asked him whether he had any fog-signals, and he said "No." I sent my fireman back to Coppull with a lamp and fog-signals to block the

line. The signalman seemed in a very confused state. I know nothing further about the distant-signal south of German Lane than that it was at danger when I passed it at about 2.10 or 2.11. The guard (Johnston) got on my engine, and we proceeded forward towards the scene of the accident. It was very thick all the way, as foggy as when I passed the German Lane distant-signal. I found the engineman and fireman in the post-office vehicles. I have known the engine-driver for 10 or 11 years. He was a very careful man, very much so. John Timms was the name of the fireman. Burrows came down on the line after Johnston and I had been into the cabin. The guard asked me if I had any fog-signals, and I said "Yes." I told my fireman to get some from the engine; he brought seven or eight. I gave two to the guard, but none to the signalman, and my fireman took the remainder back to Coppull. I was ten or a dozen yards south of the German Lane cabin when the guard came to me. The home as well as the distant-signal from German Lane were at danger when I passed them. I could not see the home-signal further than 10 or 11 yards. I saw no search for fog-signals in the cabin at German Lane. Johnston, the guard, said to me distinctly that he had been knocked down in the van; that he had come back as quick as he could, and that he had not been able to get a lamp or fog-signals. I did not pass over any fog-signals at German Lane. In telling my fireman to go back I used the following words, as nearly as I can remember: "Ralph, "go back and put two fog-signals down about 200 "yards back, and again at the distant-signal, and just "where you think fit between there and Coppull, and "tell the signalman at Coppull about the collision and "to block the line."

The evidence of the last witness's fireman was given in so unsatisfactory a manner, that it is impossible to attach any value whatever to it.

John Smalley, the station-master at Euxton (in the company's service seven years), was summoned to the scene of the accident at 2.20 a.m. by Waring, the night-porter. He reached it about a quarter of an hour afterwards. He said it was rather foggy, not very. "I could see the tail lamp of a train for "200 or 300 yards. I found the engine on its side "and a carriage across the up line. I went to the "German Lane signal-cabin, and saw Burrows (sig-"nalman); it was nearly 3 o'clock. His distant and "home-signal levers were in the position of danger for "both directions. He said he had had both his signals "against the limited mail." This witness did not go on to see the German Lane distant-signal.

John Burrows, the signalman at German Lane, the condition of whose signals form so important a portion of the present inquiry, is a man of good character, who has been in the service of the Company for 27 years. He stated that he was 55 years of age, and had been six or seven years at Balshaw Lane before he went to Coppull in December last for six weeks to learn the use of the block-instruments. Prior to his being at Balshaw Lane he was 12 or 14 years in the locomotive-department, pumping water, and also in the goods department at Whitmore. It appeared that no complaint had previously been made against him.

On the 26th of January 1874 the absolute block system was established on this portion of the railway, and he went then to the German Lane signal-cabin, and was there on duty at the time of the collision. For the first week of his time at German Lane he had a man whose name he did not know (John Wright, a relieving pointsman,) to instruct him. Burrows asserted that he was well acquainted with the management of the instruments when Wright left. This Wright confirmed, and added that he could not instruct Bu[illegible] the signal book, as [illegible]

This and
the line
16th

Coppull he had been on duty at the German Lane cabin in his turn, one week by day, and another by night. On the 19th of February he came on duty at 6 p.m. No one was with him in his cabin. He produced his record-book, of which the following is an exact transcript of the portion which is important in the present inquiry:—

EXTRACT from BOOK kept by Signalman at German Lane cabin.

Description of Train (or Engine.)	Time of Receipt of Signal "Train on Line."	Time of arrival of Train.	Time of departure of Tain.	Time of Receipt of Signal "Line Clear" from Balshaw.	Remarks.
Goods -	12.7	12.10		12.13	
" -	~~12.50~~	~~1.24~~		1.25	
" -	12.55	1.25		1.35	
Coal -	1.27	1.35			
Pass. -	1.40	2.0			
	2.4				

At 12.1 a.m. he received a telegraph from Coppull of a goods train, which passed him at 12.4 a.m., and Balshaw Lane gave him "line-clear" of it at 12.5 a.m.

He then mentioned the first goods train (12.7 a.m.), given above; this he said was stopped at his cabin (12.10) for five minutes when he allowed it to proceed on getting "line clear."

The next train passed him, he believed, at 1.24, without stopping and was cleared at 1.25. But it was stated that this entry, which had been crossed out by the signal-inspector, was altogether a mistake, no such train having passed his cabin. The record-books of the Coppull and Balshaw Lane cabins contained no entry of it, and Burrows said on hearing this that he might be mistaken.

After mentioning the train (12.55) which stopped at his cabin (1.25 a.m.) for 10 minutes, because Balshaw Lane did not block back to him, he said the coals train (1.27) came (1.35) before he received "line clear" for the preceding (Bushbury) goods train. It passed without stopping. Both the driver and the guard had their breaks on and could not stop. His distant and home-signals were at danger. The coal train thus running past them accidentally, broke the block.

He then gave "line-clear" to Coppull, and the limited mail was signalled to him thence "train-on-line" at 1.40. He would not admit that he received any telegraph of it at 1.20 whilst Gardiner (the Bushbury driver) was there. Between that time and its arrival at 2 o'clock he was looking out of the window. He had nothing do to but look for these trains and book them. He stated that he could see the limited mail 1,000 yards off as it came down the bank; he could not see his distant-signal (1,079 yards), though he could judge where it was. He could see his home-signal (22 yards). The driver of the limited mail appeared to him to be pulling up, as it was not going so fast as usual as it passed him; but he did not notice whether the breaks were applied to the train or not.

He saw the driver and fireman, and they were standing up, looking out before them.

He further said he could see the Balshaw Lane distant-signal (336 yards) on the night of the accident. It was not so foggy as it had been once before whilst he had been at German Lane. Then there was one fogman near his cabin, and another near his distant-signal, all through the night, and they brought their own fog-signals. On that occasion the train was going quite fast, at full speed, though it was foggy; and he lowered his signals, having received "line clear"

Balshaw Lane. On the night of the accident it
come with a flash of fog from 12 to 2 a.m. It
so very thick at any time. He did not apply
nals, or show his hand-light, as he thought

it clear enough for his fixed signals to be visible. Some doubt existed as to whether he had any fog-signals in his cabin, because when Johnston, the conductor, went to him immediately after the accident, he said he had no fog-signals, whereupon Johnston gave him two to place on the line. This he said was a mistake of his, he was so put about by the accident. He had 6 fog-signals all the time on the mantlepiece of his cabin, and 12 in a box ; they had been there during his five weeks sojourn, and for a long time before he came. He had had no occasion to use any during that period. He had no means of getting fog-men, even if he thought them required. This was the duty of the acting station-master at Euxton (Waring), who called them out when he thought right.

When confronted with Baldwin, he said he had not noticed him before, though he remembered stopping a light engine about 10 minutes after he had heard the noise of the collision, and about five minutes after Johnston came up. He said he was on the line when Baldwin came, but said nothing to him ; this the latter denied, as appears by his evidence already given.

Burrows further said, no permission was asked for or given to the light-engine to proceed towards the scene of the accident, but it did proceed, and then he went back to his cabin. No one had been there after the collision till then. He knew the light-engine was coming, as it had been telegraphed to him, and he had put down the two fog-signals given him by Johnstone, opposite his cabin to stop it. These were exploded by it. This again Baldwin contradicted.

With regard to the entries in his record-book for the night of the accident, he said that the signal-inspector, Parker, crossed out the 1.24 and 1.25 trains a few days after the accident, because there was no such train in the Coppull or Balshaw Lane books. His practice was to enter a train in his record-book directly he had received it.

He also said he was not able to get out of his cabin and retrim the signal-lamps when they required it. His signal-lamps were placed that night as usual by a platelayer named Wiggins. The latter stated he had put the lamp on German Lane distant-signal that night at 5 p.m., and did not see it till 11 a.m. the next day. On both occasions it was burning brightly.

Burrows solemnly declared that his distant-signal lever was in the position of danger when the limited mail passed, and had been so for 1½ hours before its arrival. Wolstencroft did not whistle till he was near his home-signal.

Some evidence was given as to Johnston having stated that the signal-man on duty had a wooden leg, but this could not apply to Burrows, or to anyone on duty in that neighbourhood during that night.

The signalman on duty at Coppull on the night of the accident was Joseph Edgerley, six years in the Company's service, 14 months of it at Coppull as signalman. He said the German Lane distant-signal was not visible from his cabin. That night a Birmingham goods train, given on to him from Coppull Hall at 12.0, passed him at 12.4, and was cleared from German Lane at 12.10. Then came a Liverpool goods train for Carlisle, given on to him 12.44, which passed him at 12.47, and was cleared at 1.24 a.m. He was sure there was no train between these two trains. The train entered and crossed out in Burrow's book was a mistake. The coal train (Springs branch and Carnforth) was usually punctual, but it was then an hour late, and arrived at Coppull at 1.8 a.m. and stopped till 1.20 a.m. Edgerley stated that he then told the driver of it to draw up and shunt across, as the mail was due from Wigan. He replied that he could not as he had 40 waggons on. He then told him he would be obliged to run in front of the mail to Euxton junction. During this period Burrows was signalling "train-on-line" from German Lane. Whereupon the breaksman of the coal train called the Coppull station-master up, to send the light engine to German Lane to see what was the matter. The station-master had just come to the window, when, at 1.24 a.m., Burrows gave "line-clear," and Edgerley told them "not to mind any more;" and the coal train proceeded (1.25 a.m.) with a direction to get into the Euxton siding as soon as possible. After this he ascertained from Wigan that the mail was running 10 minutes late. At 1.29 a light engine arrived at Coppull, and at 1.34 he shunted it out of the way of the mail train. He produced his record-book, in which he said the entries were correct. The limited mail was signalled to him from Coppull Hall siding, at 1.49 a.m., passed him at 1.53 a.m., and was signalled back as clear from German Lane at 2.2 a.m. It appeared to be going at its usual speed, 45 to 50 miles an hour. His signals were right for it to pass. It was very foggy then, and had been so for about four minutes previously. There was an interval of 28 minutes between the coal train and the limited mail as they passed his cabin. On German Lane cabin giving him line clear at 2.2 a.m., a light engine followed the limited mail. Burrows had made frequent mistakes in working the telegraph-signals. On the night previous to the accident he had reported him to the Coppull station-master in the following letter :—

"Coppull, Wednesday 18th Feb. 1874."

"Blocking back in face of the 9.0 p.m. from London.

"Dear Sir,

"This morning when I warned the above train to German's crossing, the signalman rang the block-signal and put the pin to train on line. I had to put my signals at danger in the face of the above train, causing great alarm to the engine-men and guards ; in one minute after he gave me line clear. What has to be done at such blundering times ?

"Your humble servant,

"Mr. Beecham, "J. Edgerley."

"Station-master."

This letter Mr. Beecham sent to Mr. Shaw, the district-superintendent, but owing to some miscarriage in transit, it did not reach the latter till February 21st, three days after it was stated to have been despatched. In doing so he wrote as follows :—

"Coppull, Feb. 18, 1874."

"9.0 p.m. ex-London to the north.

"J. Shaw, Esq.

"Dear Sir,

"P. C. Edgerley reports, after receiving the signal by telegraph at 2.43 a.m. of the above train approaching, he gave four beats on the bell to German's Lane crossing, which indicates be ready for fast p.m. train ; in reply he received six beats, and the needle was pinned over to train on line. P. C. Edgerley fearing something was wrong at that end, at once reversed his signals in the face of the express, which caused great alarm to the driver, guards, and passengers. P. C. Edgerley says he repeated the be ready signal, when the needle was unpinned, and the train taken all right ; a delay of one minute was caused to the express. Please let this have your attention and oblige

"Yours truly,

"H. Beecham."

Edgerley explained the circumstances:—A goods train passed him at 2.24 that day, and he received "line-clear" from German Lane at 2.40. At 2.43 he gave the "be-ready" signal to German Lane for the auxiliary mail, and at 2.45, just as that train approached his distant-signal, he received "line-blocked" from German Lane, and was obliged to throw up his signals in the face of it. The engine-driver brought his train to a stand opposite his cabin at 2.46. At 2.46 he again received "line-clear" from German Lane, and booked the auxiliary mail as leaving him at 2.47. It was cleared from German Lane at 2.50. He went on to say, Burrows made mistakes nearly every day in not signalling the trains, and not receiving them, and not forwarding them properly. He had worked with him by night for a fortnight, and found him making constant mistakes, and he seemed to get worse and worse. He thought he did not like his

situation and wanted to get away from it. He did not consider it safe to work with such a man, so at last he reported him.

He further stated that on the night of the accident, when he shunted the light engine as above-mentioned, he gave him the block-back signal with six beats on the bell. Burrows answered him with the "be ready" signal, four beats, instead of repeating the six beats to be given for obstruction. He rang a second time with six beats, Burrows replied with one. A third time he rang "six," and Burrows then replied "six," and the light engine was able to be shunted. However, he received and cleared the signals both for the coal and limited mail trains all right on that night. Burrows had been twice to Coppull to ask how they thought he worked; but he received no answer, as he had not then worked with him, and the other signalman was not in. Edgerley said, if a train ran past his cabin and broke the block he should treat it as if it had stopped there, and have both distant and home-signals on. No train had broken the block whilst he had been on duty at Coppull. German Lane was a lighter post than Coppull.

Burrows, in answer to the above, said he remembered that on the morning of the 18th of February, Edgerley gave him "six" beats, and he gave him "six" back again. He did not know what for. He afterwards gave him (Burrows) four to be ready for the auxiliary mail. Then Edgerley telegraphed the train by two beats, and he returned them, and the train arrived. He had entered it in his book as given to him at 2.24, passing him at 2.26, and cleared from Balshaw Lane at 2.27. He had omitted to enter a goods train that ran before this train in his book. It was the first day of his keeping a book, and he was not so particular in being correct. He had not often given "six" beats to Coppull unless they had first been given to him. It was not true that he had made mistakes in signalling the trains every day. He had made some mistakes, but not many, and had been very particular in signalling the trains. He liked his situation, and did not wish to leave it. He did not admit what was said to have occurred about the light-engine, before the limited mail passed on the night of the accident.

But about Edgerley's report against Burrows there can be no doubt, for it was produced by Mr. Shaw, and was sent in duplicate to the signal-inspector, Parker; and it is difficult to believe that he would have taken this step against a fellow-signalman without considerable provocation.

The signalman at Balshaw Lane, David Iddon, said he had been three years in the Company's service, and six weeks at his present post. Edgerley had taught him block-signalling with the instruments at Coppull.

The ENTRIES in his BOOK for the Night of the Accident were as follows:—

Description of Train or Engine.	Time of Receipt of Signal "Train on Line."	Time of arrival of Train.	Time of departure of Train.	Time of Receipt of Signal "Line Clear" from Euxton Junction.	Remarks.
Goods -	12.0	12.1	—	1.17	
" -	12.7	12.9	1.18	2.5	
-	—	1.25	4.13	—	not sent.
Coal -	—	4.22	—	—	not sent.

He said the goods train which preceded the coal train was not given on to him from German Lane. It will be remembered that Burrows had entered in his book an imaginary train. The time for the receipt of the answer "line-clear" from Balshaw Lane for it was is given as at 1.25 a.m. Iddon, therefore, another omission on the part of Burrows. Burrows had entered the goods train as cleared from Balshaw Lane at 1.35 a.m., or 10 minutes after it passed him; whereas Iddon positively stated that on the arrival of the goods train at Balshaw Lane he blocked over his instrument to "train-on-line," and there kept it till after the collision, and as long as he remained on duty. He placed the words "not sent" opposite the entry of it in his book before the collision, to show that it was not telegraphed to him from German Lane. He said the 19th of February was the first night on which Burrows had missed to telegraph a train. He did not keep on making mistakes. They worked perfectly together; but he always knew when Burrows was on duty. He appeared awkward when he first began to work, in giving the train on both sides of the instrument, instead of one, but he improved with practice. Trains had ran past his signals when at "danger;" but he would not then give "line-clear" back to German Lane until he had received line-clear from Euxton junction. What he added about the fog has been already alluded to. Smalley, the station-master at Euxton, spoke of Burrows as steady; no complaint had been made to him about him. As far as he had seen he was sharp, active, and quick.

Mr. Parker, inspector of signalmen for the last 13 years in the service of the company, said he went to the scene of the accident some hours after it had happened, and took a copy then of the entry in the German Lane signal-book. He did not mention the mistake Burrows had made by inserting an extra train, as already stated, to the signalman at Coppull and Balshaw Lane, but found it out from an examination of their books. Those two books agreed perfectly in all their trains. The record-books were only placed in the cabins on the Tuesday before the accident. The nightman on duty at Euxton (Waring), who is also a gate-keeper, was under his supervision. It was Waring's duty, in case of fog, to call out a platelayer, who lived 300 yards from his post, and who would, if necessary, call out other platelayers. He had known Burrows for two years; no complaints had been made against him. John Wright, who had instructed him, was a better man than the ordinary signalmen. He was a porter, pointsman, and relief-signalman. There were no means at the German Lane cabin of "speaking" to Wigan. The notices printed in the appendix to this report were, he said, posted in the cabins. The rules did not provide for a case where the engine-driver had run past a block-cabin with the signals at danger.

Mr. Beecham, the station-master at Coppull, who has been already mentioned, stated that on the night of the accident he went to the German Lane distant-signal at 3.15 a.m. It was at danger, but not burning well. It could be seen 100 yards or so. At that time a good signal-lamp might have been seen 200 or 300 yards. It seemed to be generally admitted that Burrows would not have been justified in leaving his box to retrim his distant-signal.

Next follow the statements of two engine-drivers in the habit of driving the limited mail, as to the practice they pursued in passing German Lane, and also their opinions in regard to the block-system.

Thomas Merry said, I have been an engine-driver in the London and North-western Company's service for 18 years, and 12 years on the limited mail train. I have never been in a collision. I may have passed between Euxton and Wigan on the down line about a dozen times since the block-system has been in force. It has been sometimes clear and sometimes foggy. On several occasions it has been very foggy. When it has been very foggy I have run past German Lane at a speed of scarcely 36 to 38 miles an hour, but passing Coppull at a higher speed. We should be expecting to find the block-signal on, and we should be preparing to stop if necessary at Euxton junction. Before the block-system came in force, we began to prepare near the German Lane cabin for stopping if necessary at the Euxton junction, and since the block-system has been in force we generally slacken speed a little sooner, expecting that we may find the block on.

I do not like the block-system as it is now worked. The block-cabins are not at uniform distances from one another, and we may get warning for a long distance or a short one, according as the cabins are further from or nearer to each other. I think it would be better and safer for the traffic generally if we were informed by a caution-signal from A cabin when there was a train between B and C, instead of having the signals all right at A in such a case. It would be far better if we had more break-power. It is a very difficult job in a fog, when we are running fast and heavy trains, to stop them between the distant-signal and the home-signal, after only receiving warning for one section in advance. Supposing a train to stop just beyond the home-signal of a block section, the fixed signals previously exhibited may not be sufficient when the section is short. If the break power was in the hands of the engine-driver instead of in the hands of the guard it would be better. We have no means of knowing that the guard's breaks are applied after we have whistled for them. I know the German Lane distant-signal. It is on the slope of the cutting and on the left of the line. It is a prominent signal in clear weather, but is too far off for foggy weather. I have never found it so foggy that I could not see it. It ought to be half as near again to the line as it is to be discerned at all times. I have not had such fogs there this winter as in some seasons. I have never complained of the signal. I knew the driver (Wolstencroft) who was killed very well. We exchanged ideas about our difficulties, and with regard to the particular portions of the line which should be approached with greater caution. We have talked of the German Lane cabin as being placed in a difficult position near the bottom of an incline and on the approach to Euxton junction. In case of a train being stopped a little way beyond the German Lane cabin, it would be very difficult for an engine-driver, unless he received a signal at Coppull, to pull up short of such a train. In fact my objection to the block system as here worked is that the German Lane cabin is situated at the bottom of a bank, and at a very difficult place for stopping a through fast train, and I think we ought to receive warning at Coppull with a caution signal when a train obstructs the line between German Lane and Balshaw Lane instead of receiving all right at Coppull directly a previous train has passed German Lane. If Wolstencroft had seen the German Lane distant-signal at *danger*, he might in ordinary weather have stopped short of the coal train, but there might be some difficulty in certain states of the weather. He could not have pulled up short of the coal train if he had seen the German Lane home-signal only at "*danger*." What I have said above as to exhibiting a caution-signal from cabin A when the section B to C is occupied by a train is the wish and feeling not only of myself, but of the engine-drivers generally as far as I am acquainted with it. I do not remember any other incline in respect to the block cabins similar to the one in question. The limited mail always runs at high speed past that spot. If the engine-driver, Wolstencroft, had been unable in the fog to see the distant-signal from German Lane, there is no doubt he would have slackened his speed. It would have been his duty to stop his train before reaching the home-signal if possible, and then to be guided by the indication of the home-signal. That regulation is strictly observed by engine-drivers.

Joseph Sleigh said :—I am an engine-driver in the service of the London and North-western Railway Company. I have been so for 22 years. I have driven the limited mail for between four and five years. I have tried the "cabs," and you can see the signals better with them than without them, in fogs or rough nights. I always slacken speed when running in a fog, but not so much where obstructions are not expected as where they may be found. There are some parts of the line where I run faster than at others. The bank near the point of collision is a place where I would expect an obstruction. I would look for a block-signal. If there were a floating fog it would make very little difference in the speed, but it would put us on the alert I should be afraid to pass a platelayer without noticing him. I would not expect fogmen in a floating fog. I would go down the incline near the place of collision with due caution in a floating fog, at perhaps 10 or 15 miles an hour less than in clear weather. I would run down that bank at 35 or 40 miles an hour with such a train as the limited mail in a fog and when the rails are greasy. If it were a dense fog I would go down at the same speed. It is a rule to diminish the speed some slight thing in a fog. I would always do so in practice. My speed down that bank is usually, as nearly as I can say, from about 45 to 48 miles an hour. I do not care to say what I would think of a man going down that bank at 50 miles an hour in a fog. I would not do so. I would not be afraid of being found fault with for losing time. I have been questioned as to losing time,—I mean that inquiry has been made, but my reasons have always proved satisfactory. Engine-drivers are directed to use greater caution in running through fogs. We have a rule in our book specifying that we are to use greater caution particularly near crossings or junctions or where shunting may be expected. We find it unpleasant travelling in fog, wishing to keep our time and also to run with safety. It is also very unpleasant to the eyes in a fog. We must run risk in order to keep time in a fog. I have lost as much as five minutes or more in a length. I have never found a fog so thick that I could not see the German Lane distant-signal. That signal is placed at the top of the slope of a cutting, some distance from the rails, in order that it may be seen over a bridge which intervenes in approaching it from the south. It might be better placed if it were nearer the line, but I have never passed it without seeing it. It has only been there for a few weeks, and during that time I have not seen thick fogs there. I consider it essential to safety to slacken speed in going down that bank in a fog. I should certainly do so in foggy weather. When I get the signal taken off at one cabin I do not expect to find a train between it and the next cabin ; but I look out nevertheless, as there are gates which may be in the way, or a break-down may have occurred on the other line, or there may be platelayers on the road. I do not believe the block system makes any difference at all with respect to caution. I do not feel more satisfied under this system than under the other. I have not increased confidence. I should say that the deceased driver would run much as I would under similar circumstances. He was a very particular, careful man, and had had a great deal of conversation with me. We have talked together of the signals being placed where they could not be well seen. With regard to losing time, the deceased driver has told me that he lost so many minutes owing to the fog. We have both lost time in consequence of fog, and have spoken together about it. I did not run over that part of the line that night. There is never any further enquiry when loss of time is set down in the guards journals to fog. Inquiry has been made when I have lost time in consequence of bad wind or slippery rails. Wolstencroft (the deceased driver) has told me that one of our directors asked him to point out any signals which were improperly placed, and he had done so. I do not know the signals he spoke of, or whether they were altered. We should prepare to pull up if we could not see a signal. I myself should treat a signal which I could not see as being against me. I should think that a train like the limited mail, running on slippery rails, down a gradient of 1 in a hundred, at 48 miles an hour, coming suddenly upon a signal, could be brought to a stand in about 1,500 yards. It might require more if the rails were very slippery, and perhaps less if the guard's breaks were immediately applied. The latter operation would make a difference of 300 yards, but we cannot rely upon its being done. To bring my train to a stand as soon as possible, I should first shut the regulator and then whistle for the guard's breaks.

Mr. Thomas Edlestone, who had been locomotive-foreman at Crewe for the last 15 years, and in the service of the Company for 30 years, stated that he regulated the running of the engine-drivers. Wolstencroft had passed the German Lane signals on the down line four times with the limited mail, and six other times (thrice by day and thrice by night) with express trains since the introduction of the block-system between Euxton and Wigan, on the 26th of January 1874, so that he was on his seventh night journey past them when the accident happened. He had been under his orders 15 years, and he had always found him careful, willing, and steady, and had the greatest confidence in him.

He agreed with Merry, that considering the speed at which they are required to run, and the proportion of break power in the trains, he thought it would be a great improvement if caution signals were exhibited at A cabin as long as there was a train between B and C. He thought more break-power should be given to engine-drivers, and that the absolute block-system was safer, and consequently better, than the permissive system if properly carried out.

Mr. George Whale, for eight years assistant out-door superintendent of the locomotive department, also agreed that caution signals should be shewn at A cabin, to through fast trains, when there was a train between B and C. It would afford safety in the case of slow trains, but it was not so necessary for them as for fast trains.

He said also that he had to detail the duties of engine-drivers. He believed it to be their practice to slacken speed in a fog. In approaching junctions they would reduce to 15 or 20 miles an hour, but in the straight line away from these, not so much. In this case, if nothing had happened, yet if Wolstencroft had been reported for running at excessive speed in a fog, they would have reprimanded him. They should not run 50 miles an hour in a fog when you could not see a red light more than 10 yards off. There were no special instructions as to fogs beyond those contained in the rule-book. It was left to the discretion of the engine-drivers how they obeyed rule 210. There had been no reports sent to him from his division (the northern division of the London and North-western railway) of drivers running at too high a speed in a fog. There might have been to Mr. Rigg; but if so, no investigation had been necessary. Engine-men had been punished for losing time, through bad management of their fires, &c., and had been fined. As soon as there was a report, it was sent to them for explanation and fully inquired into. No man would be punished for running cautiously in a fog, which was a good reason for a train being late.

The engine attached to the limited mail on the night of the accident was from Crewe. It was a 4-wheel-coupled engine, with 6 feet 6 inch driving, and trailing wheels, and 3 feet 6 inch leading wheels. The cylinders were 17 inches in diameter, by a stroke of 24 inches. The engine weighed about 30 tons, and the tender, when loaded, 20 tons. There were breaks on all the tender wheels, but none on the engine. There was a cab over the engine footplate. Cabs of this description had been supplied for the last two years, and had been employed for some time by the Great Northern and other companies. He thought them good things. They did not prevent the men from looking out. You could see a little better with them than with the old weather-board, in his opinion. There was a larger glass window, which could be opened.

On a falling gradient of 1 in 100, with greasy rails, he thought such a train could be pulled up in three-quarters of a mile. Assuming that Wolstencroft had not seen the German Lane signal till he was close upon it, he did not think he could have pulled before the point of collision. If he had commenced at the German Lane distant-signal, and made every exertion, he thought he might have done so. He confirmed the high characters of Wolstencroft, and John Timms, the fireman. No complaints had ever been made against Wolstencroft for running too fast in a fog, or for any other cause, nor had he ever been cautioned.

Mr. John Rigg, the assistant locomotive-superintendent of the Company, after speaking in high terms of Wolstencroft, said he agreed with Mr. Whale, and those who thought that a caution-signal being given at A until the line was clear between B and C would be a very desirable addition to the present block system, and he thought it necessary for fast and slow passenger trains and also for goods trains. The traffic would be worked more safely and expeditiously with it. In this case, if Wolstencroft had received a caution at Coppull, indicating an obstruction between German Lane and Balshaw Lane, he would have prepared in running down the bank to pull up short of such obstruction; whereas after receiving a clear signal at Coppull, he would descend the bank in doubt, and depend on the German Lane signals only to tell him whether there was such an obstruction. It might be thought an additional impediment, but he believed on the contrary, that the use of caution-signals as proposed would enable men to run with greater confidence, greater regularity, and greater safety. With this addition he would prefer the block system to the permissive system. He did not believe the addition of the caution-signal as proposed was in use on any railway. They could have nothing better than the block system when it had attained proper working order, with sufficient warning to the men in proportion to the break-power with which they were supplied, and the speed at which they were timed to run. He also thought it of great importance that more break-power should be placed in the hands of the engine-drivers. He did not agree with Merry about placing block-cabins at uniform distances, as it would be impossible in practice.

Conclusion.

This collision, on the 20th February, is the more important as having occurred—between the Scotch limited-mail train, and a coal train, standing in its way,—on a portion of the line on which the block-system had so recently been brought into operation as the 26th January. The engine-driver and fireman of the limited-mail train can no longer, unfortunately, speak for themselves, but it would appear from the evidence, and from the circumstances of the case,—that they received clear signals at Coppull, —that they approached the German Lane crossing at high speed in a thick fog,—and that they probably did not receive any warning from the distant-signal from that crossing. The engine-driver had passed that signal six times previously by night, and three times by day since it was brought into use; and it was, we believe, at danger; but it was not well situated for being seen in a fog, and the lamp of it was burning dimly. They thus received warning, first from the home-signal at that crossing, and secondly from the Balshaw Lane distant-signal, 314 yards beyond it. They whistled several times for the breaks; but the head-guard, riding at the tail of the train, and busily engaged with his parcels, did not hear the whistle; and they came, still at high speed, into collision with the coal train, 750 yards beyond the German Lane cabin. The gradient was a falling one of 1 in 100, to within 257 yards of the point of collision, after which the train travelled up a rising gradient of 1 in 660. The rails were probably not in good condition. There were two six-wheeled break-vans out of nine vehicles, besides the tender-break. The engine-driver is represented to have been a steady, cautious, experienced man. If he had seen the German Lane distant-signal at danger, he would, no doubt, have been able to avoid the collision; but the German Lane home-signal did not, without any assistance from the break of the head-guard, afford him sufficient warning to enable him to avert the very serious disaster which followed. The most important evidence as to the condition of the German Lane distant-signal was that of the engine-driver and fireman of the coal train. These men, in passing that signal in front of but at much less speed than the limited-mail train,

could only see a "glimmer of white light" from it when they were very near to it, though they believe it to have been at danger; and it would seem, therefore, only too probable that the deceased engine-driver and fireman of the limited-mail train may, while looking up between the lamp and the red glass in front of it, have seen only the same "glimmer of white light" in passing the signal at high speed, and may have supposed it to be at all right instead of at danger. It would not be difficult in such a case, when it is found necessary to place a distant or other signal so far from and so high above the line, to add a duplicate arm and lamp in a better position to catch the eye of a passing engine-driver under all circumstances.

The German Lane crossing appears to have been adopted as a block-station, because it was necessary, under any circumstances, to keep a man there for the protection of the crossing; but, being on a falling gradient of 1 in 100, it is not otherwise in a good position, in connection with the Euxton Junction, and having reference to the through fast traffic; and it would appear that the suggestions of the engine-drivers and their superiors might be advantageously adopted, at all events with regard to that block-station, by exhibiting a caution-signal at Coppull when trains are stopped between German Lane and Balshaw Lane. The evidence above given of the other engine-drivers, and of their officers in the locomotive department, namely, the assistant locomotive-superintendent, the out-door locomotive-superintendent, and the locomotive-foreman at Crewe, is very valuable, and is worthy of attentive perusal. These officers of the Company, who, from practical experience in such matters, are in so many respects well able to judge, speak strongly of the necessity for affording additional warning in certain cases to the engine-drivers, and for supplying them with more break-power under their own immediate control. The present collision is certainly an illustration in support of their views, under the circumstances, especially of a fog, of a distant-signal badly lighted and badly seen in that fog, and of the guard at the tail of the train not having heard at so vital a moment the engine-driver's whistle for the breaks.

It is to be remembered, also, that the engine-driver and fireman of the goods train which was standing in front of the coal train, knowing the condition of the atmosphere and of the German Lane distant-signal, and all the circumstances of the case, actually expected the collision. They thought it might happen. They were "ready to make a dart." They moved forward about 17 waggons lengths to avoid it.

The signalman, Burrows, in charge of the German Lane cabin, had, as will have been observed, made mistakes so constantly in working the block-instruments, that the signalman at Coppull was afraid to work with him, and had reported him two nights before the collision. He made mistakes even in regard to the light-engine which was shunted at Coppull just before the collision, to allow the limited-mail train to pass it at that place. He made wrong entries in the record-book with which it was thought right on the previous day to entrust him and other signalmen, in regard to the trains immediately preceding the limited-mail train. It is true that he denies the greater number of the allegations against him in these and other matters, but it is not possible to disbelieve the important statements of the Coppull signalman, Edgerley, confirmed as they are by the report, quoted in the above summary of evidence, which he made in writing, and by the expression contained in it of "blundering times." It was unfortunate that this report, dated on the 18th, and forwarded by the Coppull station-master on the 18th, did not reach the officers who might have dealt with it till after the collision on the 20th of February. A more active and intelligent signalman, on finding that the coal train had "broken the block," might have caused the limited-mail train to be warned at Coppull instead of giving line clear to that place, and would also have applied fog-signals on such a night, and after being told that his distant-signal lamp was burning badly.

The statements of Burrows were at variance in almost every respect with those of nearly all the other servants of the Company who came in contact or were working with him; and there was, as will have been seen, much conflict of evidence amongst some of the other witnesses. Burrows exhibited at once an anxious desire to do his duty properly, and a mistrust of his own efficiency, by going off in the direction opposite to his home, after his night's duty, to enquire of the signalman at Coppull whether he had given satisfaction. It would be difficult to imagine a man less fit for the duties of a signalman at a block-cabin. But it is, having reference to his long service and previous good character, fair to him to observe, that he had only recently been employed in working the block-telegraph system, and was commencing to do so at a comparatively late period of life.

In order to secure the greatest, or even a reasonable degree of safety, especially on a portion of line carrying so much traffic, traversed by trains running at the highest speed, and constructed with heavy gradients, it is not sufficient merely to establish the block-system, but it is necessary to do so under good conditions and with due precautions. The block-cabins should either be in good positions, and at sufficient distances from one another to afford ample warning to the engine-drivers in proportion to the break-power at their command, or the engine-drivers should receive warning over an extra block-length. The signals should be so arranged as to be efficient under all circumstances. Responsible and efficient signalmen should, above all, be employed. Ample break-power should be placed in the hands of the engine-drivers. Trains ought not to be run at high speed in thick fogs, and still less so in the case of fogs suddenly occurring, before the fogmen have been called out. It is to the absence of such precautions that the present serious collision must be attributed; and it is by further endeavours to adopt them that such collisions may best be avoided in the future.

I have, &c.,

H. W. TYLER.

The Secretary,
(Railway Department),
Board of Trade.

I concur in the above report.

WM. W. RAVENHILL.

APPENDIX.

LONDON AND NORTH-WESTERN RAILWAY.

District Superintendent's Office, Lime Street Station, Liverpool, January 20th, 1874.

NOTICE to Station-masters, Signalmen, Engine-drivers, Guards, Breaksmen, and others.

ABSOLUTE BLOCK WORKING between Wigan (No. 3 Box) and Euxton Junction.

Commencing at 6.0 a.m. on Monday, January 26th, the line between Wigan (No. 3 box) and Euxton junction will be worked on the absolute block system, in accordance with the General Manager's circular, No. 978, dated January 24th, 1873, and the revised general regulations for train signalling by block telegraph, dated June 1873.

The signal stations, with the signals and their respective positions, are enumerated on the fly leaf.

On the 23rd, 24th, and 25th instant, the necessary alterations and removal of signals will be carried out; engine-drivers, guards, and breaksmen must be on the alert to attend to any signal that may be exhibited.

Inspector Parker to appoint special signalmen, and make what other arrangements may be necessary for the safe working.

JAMES SHAW,
Superintendent.

Up Signals.

Distance.	Signal Station.	Description.	Position.
Miles. Yds.			
	Euxton junction -	Distant -	Up side.
		Main -	Up side.
1 392	Balshaw Lane crossing -	Distant - -	Up side.
		Main - -	Up side.
1130	German Lane crossing -	Distant - -	Up side.
		Main - -	Up side.
1 890	*Darlington's siding -	Distant - -	Down side.
		Main - -	Up side.
		Starting (slotted from Coppull station).	Up side.
833	Coppull station -	Main (slotted from Blainscough siding).	Down side.
		Starting do. do.	Down side.
528	*Blainscough siding -	Starting - -	Down side.
1293	Coppull Hall siding -	Distant - -	Down side.
		Main - -	Down side.
		Starting - -	Up side.
1742	Bradley Hall siding -	Distant - -	Down side.
		Main - -	Up side.
1 1080	Boar's Head junction -	Distant - -	Up side.
		Main - -	Up side.
		Starting - -	Up side.
1383	Ryland's siding -	Distant - -	Up side.
		Main - -	Up side.
		Starting - -	Up side.
1653	Mesnes siding (Turner's)	Distant - -	Down side.
		Main (slotted from Wigan north box).	Down side.
		Starting - -	Up side.
593	Wigan - - -	Main - -	Down side.

Down Signals.

Distance.	Signal Station.	Description.	Position.
Miles. Yds.			
	Wigan - - -	Starting (loop line)	Down side.
		Main - -	Down side.
593	Mesnes siding (Turner's)	Distant - -	Down side.
		Main - -	Up side.
		Starting - -	Down side.
1653	Ryland's siding -	Distant - -	Down side.
		Main - -	Up side.
		Starting - -	Down side.
1383	Boar's Head junction -	Distant - -	Up side.
		Main - -	Up side.
		Starting - -	Up side.
1 1080	Bradley Hall siding -	Distant - -	Up side.
		Main - -	Up side.
1742	Coppull Hall siding -	Distant - -	Down side.
		Main - -	Up side.
		Starting - -	Down side.
1293	*Blainscough siding -	Distant - -	Down side.
		Main (slotted from Coppull station).	Down side.
528	Coppull station -	Main (slotted from Blainscough siding).	Down side.
		Starting (slotted from Darlington's siding).	Down side.
833	*Darlington's siding -	Main - -	Up side.
		Starting - -	Up side.
1 890	German Lane crossing -	Distant -	Down side.
		Main - -	Down side.
1130	Balshaw Lane crossing -	Distant - -	Down side.
		Main - -	Down side.
1 392	Euxton junction -	Distant - -	Up side (at Euxton station).
		Main - -	Up side.

Note.—Signal stations marked * are day posts only.

The main and distant signals for Standish and Euxton stations must be placed at danger when the main line is obstructed at those stations.

Notice to Station-masters, Foremen, Signalmen, Enginemen, and others.

Fogs and Snow Storms.

Instructions will be found at Rules 134 and 285 to station-masters and platelayers respectively with reference to platelayers being sent out on fog-signalling duty, when the fog is so thick as to require it; and the same regulations will apply in case of heavy snow storms.

Station-masters must arrange with the traffic inspectors to have the names and addresses of the platelayers recorded at their stations, and must come to an understanding with the ganger of the district as to the positions on the line which are to be occupied by the respective platelayers in case of fogs or snow storms coming on by day or at night, and also as to their relief at proper intervals should the fog or snow storm continue.

If the fogmen are out more than six hours, arrangements must be made for furnishing them with the needful refreshments.

The traffic inspectors in their respective districts, and the station-masters and foremen at stations, goods yards, and marshalling sidings, will be held responsible for making provision with the inspectors or gangers of the permanent way for summoning and placing fogmen at all the signals and points necessary to be protected by them.

Should fogs or snow storms come on in the day while the platelayers are at work, or at any other time, it is their duty at once to repair to the positions allotted to them for fog-signalling, without waiting for any communication from the station-master, junction-man, or signalman. This will not relieve the station-master, junction-man, or signalman from the responsibility of sending for the platelayers, unless they have satisfied themselves that they are out fog signalling.

Each fogman must take with him a hand lamp, a set of flags, and an adequate supply of detonators.

The fog signalman when sent out must be placed outside the distant-signal, and sufficiently near to the post to see what signals are exhibited thereon. When the signal is at danger, the fogman must first place two detonators on the rails opposite to where he is standing, sufficiently far apart to give two distinct reports, and then, without loss of time, go further along the line (showing a red light with his hand lamp) to such a distance as to ensure any approaching train being stopped in time. On arriving at this distance he must put down two, or, if thought necessary, three additional detonators, sufficiently apart to explode separately (*see sketch below*). He may then return to the distant-signal post to ascertain when the signal is changed to show "all right;" and so soon as this is the case, he must remove the detonators furthest from the post, and then those close to the post itself.

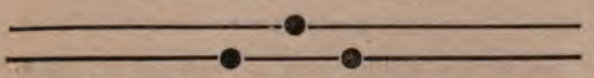
If the distance between the distant-signal post and the point at which the furthest detonators are put down exceeds 300 yards, the fogman must, on his way, put down an intermediate detonator 150 or 200 yards outside the distant-signal.

When the distant-signal is again turned on to "danger," he must go back again and act in accordance with the foregoing instructions.

Should any train arriving at a station come to a stand between the distant and main signals, the fog man, in addition to placing two detonators on the line opposite the signal post, must proceed still further back, and place additional detonators on the line, as instructed in Rule 42, in order that protection may be afforded so long as the train remains within cover of the distant-signal. These detonators must under no circumstances be removed until the fogman has satisfied himself, by returning to the distant-signal,

that the line is again clear. This operation must be repeated as often as necessary during the time he is on duty.

(*Sketch referred to above*).



At intermediate telegraph posts, the man in charge of the signal-box must, when the danger signal is exhibited at his box, place two detonators on the rails sufficiently apart to give two distinct separate reports, except in cases where platelayers are appointed to repeat the distant signals worked from the signal-box. When these men are on duty, the placing of detonators on the line will devolve upon them.

On a fog or snow storm coming on suddenly, and the fogmen not having taken up their positions, enginemen are instructed to stop at the main signal-cabin and ascertain whether the section in advance is clear.

In foggy weather, when the arms of the semaphore signals cannot be seen plainly, the signal lamps must be kept burning by day as well as by night.

During foggy weather or snow storms, when a train or engine has stopped at a station, or is shunting into a siding under the protection of the main and distant signal, the signal "line clear" must not be sent to the block station in the rear until the train or engine has proceeded on its journey, or has shunted into a siding clear of the main line.

Detonating Signals.

It will be understood that detonating signals are to be used on all occasions when it is necessary to stop approaching trains, whether by day or night, alike in clear as in foggy weather.

These signals are to be placed on the rail (label upwards), by bending the lead clip round the upper flange of the rail, to prevent their falling off. When the engine passes over them, the signals explode with a loud report. So soon as the engine passes over one of these signals the driver is to treat it as a "caution" signal, shut off steam, and proceed cautiously until he ascertains the cause of obstruction, or receives an "all right" signal to proceed. Two or more signals indicate "danger;" and should the engine pass over two signals in succession the driver is immediately to stop the train, and afterwards proceed slowly to the cause of obstruction, or act in accordance with the instructions that may be given by the person who has placed the detonators on the line.

Packets of these signals must be kept at the stations or junction boxes in connection with which fog signalmen are employed, so as to enable them to obtain a further supply, should their stock become exhausted. Care must be taken to keep them in a dry place, and not to allow the stock to get old.

Full instructions for the guidance of engine-drivers guards, breaksmen, station-masters, platelayers, and others, will be found in the Rule Book, commencing at page 13 ; also page 80, Rule 210.

During frosts or sudden changes of temperature, men in charge of points and signals will be held responsible for having them examined by the platelayers or ganger to see that they work correctly, and that the expansion or contraction of the rods and wires has been properly adjusted by means of the regulator ; and in addition to this, it will be the duty of the signalmen, when going off and coming on duty, to ascertain that the points, signal-lamps, and arms are working correctly in accordance with the movements of the levers.

Care must be taken after heavy falls of snow to examine the working of the exposed portions of the apparatus in connection with the signal-posts, in order to see that no obstruction has been caused by the accumulation of snow, so as to prevent the proper action of the arms and lamps.

During snow storms the platelayer who is employed to repeat the distant-signal must look to this, but if no fogman is employed, the ganger on duty must do so while the snow, or its effect, continues.

By order,

General Manager's Office,
uston Station,
February 1874.

W. Cawkwell,
General Manager.

Circular to Station-masters, Signalmen, Passenger Guards, Breaksmen, Engine-drivers, Firemen, and others concerned.

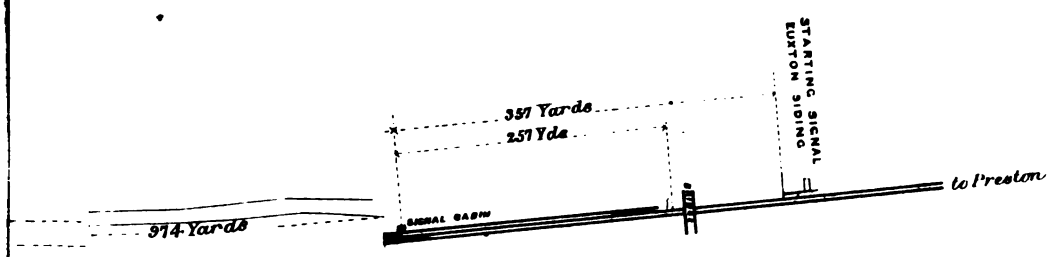
Upon those portions of the line where the absolute block system is in operation, the ten minutes interval, fixed in Rule 127 of the book of rules and regulations, is to be reduced to five minutes.

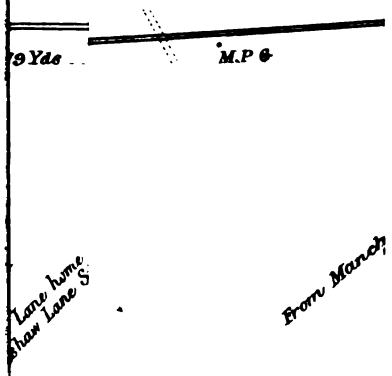
When a train is stopped at a block telegraph signal box waiting "line clear," there will be no necessity for guards to go back with signals to protect it, but under any other circumstances in case of a stoppage on the line, when a train or engine is travelling between two telegraph sections, it will be necessary for the guard, breaksman, or fireman (as the case may be) to go back and protect the train or engine, in the same way as required by the rules for protection in case of failure on portions of the line not worked under the absolute block system.

W. Cawkwell,
General Manager.

Euston Station,
April 28th, 1873.

To accompany Report of Court of Inquiry into Collision at Euxton Junction on the 20th February 1874, Dated 24th March 1874.





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For Her Majesty's Stationery Office.

THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE,
DATED THE 12TH SEPTEMBER 1874,

INTO THE CIRCUMSTANCES ATTENDING THE COLLISION ON THE

GREAT EASTERN RAILWAY

WHICH OCCURRED NEAR

N O R W I C H

On the 10th September 1874.

Presented to both Houses of Parliament by Command of Her Majesty.

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THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE, DATED THE 12TH SEPTEMBER 1874, INTO THE CIRCUMSTANCES ATTENDING THE

Collision on the Great Eastern Railway which occurred near Norwich on the 10th September 1874.

Board of Trade,
(Railway Department),
SIR, 1, *Whitehall, 30th September* 1874.

IN compliance with your appointment of the 12th of this month, I have the honour to report to the Board of Trade the result of the public inquiry into the collision which occurred on the night of the 10th of September, about $1\frac{3}{4}$ miles from the Norwich (Thorpe) station on the Great Eastern Railway.

On this occasion the express train, due to leave London at 5 p.m., and Norwich at 9.10 p.m., came into collision with the up mail train, 8.20 p.m. from Lowestoft, and 8.40 p.m. from Yarmouth, which was running in an opposite direction on the same line of rails, at about half-past 9 p.m. I regret to say 19* passengers, of whom one was a servant of the Company, and 4 other servants of the Company, were killed on the spot or have since died from their injuries, besides 73 passengers and 2 servants of the Company who were more or less seriously injured.

The Court sat in the Guildhall at Norwich, which was kindly placed at our disposal by the Mayor of that city, who further afforded us every assistance during our investigation.

After an inspection of the scene of the accident, proceedings were commenced on Monday the 21st of September, and were continued on the following day. After an adjournment, they were resumed on Monday the 28th, and were concluded on Tuesday the 29th instant. Altogether, 33 witnesses were examined, and their sworn depositions accompany this report.

The Coroners for the county of Norfolk and for the county of the city of Norwich, who were holding independent inquests on the bodies of persons killed in the collision, attended our inquiry and rendered us valuable assistance which we desire thus to acknowledge.

Description.

The Great Eastern Railway has a double line of rails from the Thorpe station at Norwich, for rather more than a quarter of a mile, to the Norwich (Thorpe) junction, whence it diverges to Brundall and Reedham for Yarmouth and Lowestoft on the east, and to Ely on the west. From that junction to Brundall, about $5\frac{1}{4}$ miles, the line is single; but a portion of it, about $1\frac{3}{8}$ miles long, to the East Norfolk junction, is in course of being doubled, and will shortly be opened as a double line for traffic; and powers have been obtained for doubling the remainder of the line to Brundall. From the latter place to Reedham, six miles and a half, the line is double; and thence to Yarmouth and Lowestoft there are single lines. According to the evidence of Mr. Langley, the engineer of the Company, the site of the collision (shown in diagram No. 1), was about 126 chains from the Norwich (Thorpe) station, and $1\frac{3}{4}$ chains on the east of the river Yare; and the Norwich train would have run for 13 chains up a gradient of 1 in 2,443, then for 10 chains up 1 in 357, and then for about $2\frac{1}{2}$ chains down a gradient of 1 in 228; whilst the train from Brundall would have been ascending a long gradient of 1 in 228 up to the point of collision.

At the Norwich (Thorpe) station there is an arcade, under which are two platforms (shown in diagram No. 2), with three lines of rails between them. The booking and telegraph-offices (diagram No. 3) are on the departure-platform. The telegraph-office has a small window, with an aperture below it, $9\frac{1}{2}$ inches wide by $12\frac{1}{2}$ inches deep, closed by a wooden shutter, and referred to in the evidence as the telegraph-wicket; and a desk under it on which messages may be written. A special book is kept in this office in which single-line messages should all be entered. The distance from the telegraph-window to the edge of the platform is about 23 feet. This window is also about eight yards from the open end of the arcade, and 70 yards from the closed end of it. It is, therefore, conveniently situated to enable anyone in charge of the station to communicate with the telegraph-clerk. There is no entrance from the platform to the telegraph-office, and the only means of communication between the platform and the telegraph-office is through the aperture or wicket below the window above referred to. At the back of the telegraph-office, and on the road of approach to the station, there is a door, and near this door is a desk for the use of persons sending ordinary messages. There is a glass screen between this desk and the interior of the office, but the public are in the habit of also writing messages on the desk below the aperture on the platform. Inside the telegraph office there are eight speaking instruments, of which the third from the approach road and the sixth from the platform is used for messages between Norwich and Brundall, though this instrument appears to be used also for other purposes when required. This description of the telegraph-office and its fittings will be better understood by a reference to diagram No. 3. The departure-platform is continued beyond the arcade, and the ticket-platform about half-way between the middle of the station and the Norwich (Thorpe) junction, as will be seen in diagram No. 2; but there is a curve in the line to the left in looking from the departure-platform, and the ticket-platform cannot be seen from the departure-platform by a person standing opposite the telegraph window. The end of it becomes visible, however, on stepping off the platform across the departure-line, to the further side of that line of rails.

The Evidence.

In giving a summary of the evidence it will be desirable to commence with that which treats of the system of working the traffic over this portion of the line, and then to proceed with that relating to the facts of the case.

Mr. James Robertson, superintendent of the whole of the Great Eastern Railway for the last 18 years, in describing the arrangements for working the traffic over this portion of their system, said, all ordinary trains were passed over the single line in accordance with the working time-tables for goods and passenger trains. If any irregularity occurred the trains were directed by telegraph. The regulations on pp. 46, 47 of the Company's working time-tables (now put in), comprised all that was required, and was enforced, in the working of the single line between Norwich and Brundall. These regulations had been in force for 20 years, so far as they were contained in the Company's rule-book. Engine-drivers of all trains had to be furnished by written authority before passing

* Afterwards increased by two other deaths.

over this single line, and without written orders no engine-driver could do so. He produced the order, dated 28th August 1872 (Appendix A.), under which this was done, and also a copy of the form of ticket to be given to each engine-driver passing over the single line (Appendix D.). There were no instructions beyond what had been thus produced for the working of the single line between Norwich and Brundall. The only alteration during 20 years had been the addition of this starting order. The book produced containing entries of telegraph messages was used specially for this particular portion of single line and for that purpose only. The practice was to sign the entries before the messages were sent, and there was an order by the chief of the telegraph-department on that subject. Replies should also be signed before action was taken on any message. This had been the practice, but there were no printed or written instructions for it. The object of these regulations was to enable those in charge of the stations to alter the crossing-places so as to facilitate the running of the trains.

He put in a copy of a letter, dated 21st November 1872 (Appendix B.), to the district superintendent, Norwich, with reference to the starting of the 8.40 p.m. mail train from Yarmouth to London.

In altering the crossing of trains a message should be sent from Norwich to Brundall, signed by the inspector on duty before it was sent. The inspector was the responsible man. He might employ the clerk to write it, but it was the inspector's message, and the telegraph-clerk was responsible if he sent it without signature. If the inspector could not get an immediate reply, it would still be his duty, even if he left the telegraph-window, to return, and receive that reply, and sign it. The message would be complete at Brundall on being received there with the signature of the Norwich inspector, and the train might be despatched from Brundall accordingly. They trusted to the inspector that he had sent the message to Brundall, and would not send any other train to Brundall. In the event of a change of duty, they trusted to communication between the men to prevent one man from ordering a train from one direction and another man from starting a train in the opposite direction. He had never considered it necessary to make any extra safeguard to meet this contingency. The amount of traffic and the number of special trains running had prevented the adoption of the train-staff system. There were a great number of special fish-trains. With the experience of this accident he should not be disposed to adopt the train-staff system between Brundall and Norwich because the traffic could not be carried on without great irregularity. If the train-staff system was possible it would give additional safety, and he would adopt it to-morrow if he thought the traffic could be carried on. He would recommend that the train-staff system should be adopted between the East Norfolk junction and Brundall when the double line had been completed from Norwich to the East Norfolk junction. He had had that in view for some time, and should further recommend his directors to adopt the same system between Reedham and Yarmouth and Reedham and Lowestoft. Where the train-staff system could not be adopted he knew of no other safeguard that he could recommend. It would be easier to work between the East Norfolk junction and Brundall on the train-staff system than between Norwich and Brundall, as one length was four and the other six miles, and it would be easier to send from either end in the event of a break-down and more easy to pass the trains on account of the shorter distance.

Mr. Thomas Stevenson, district superintendent for the Great Eastern Railway Company, said that his district extended for 220 miles, from Norwich to Ely, from Ely to Wells, from Wells to Heacham, from Dereham to Hunstanton junction near Lynn, from Norwich to Yarmouth, from Reedham to Lowestoft, also from Yarmouth to Beccles on the East Suffolk section, from Norwich to Tivetshall, and from Tivetshall to Beccles. This included the portion of line upon which the late accident occurred. He had been in the service of the Company for 27 years from last May. Till 1852 he was principally in the goods department at Thorpe station, Norwich. In November of that year he was appointed station-master there. At that time the single line between Norwich and Brundall was worked under his immediate supervision, and until he was appointed district superintendent in March 1854. It was worked then as now. He found it so and continued it. When trains were working in their ordinary course, that was to say, in accordance with the working time-tables, no telegraphic message was sent, no other than verbal orders were given to the engine-drivers, and, in fact, they trusted to the time-tables for safety. In the event of any irregularity he believed a message was sent, for instance, from Norwich to Brundall, asking for a certain train to be sent on in the same form as was now employed. He gave the messages himself and not through an inspector, and they were forwarded by a telegraph-clerk. He started the trains, or, in his absence at meals, &c., the inspector on duty. No irregularity, with one exception, ever occurred up to the present time in working the single line. It occurred on a Saturday, when they were blocked with traffic from Yarmouth, about 17 years ago. He had ordered a special to be got ready to Yarmouth, and a shunter who had no authority to start the train, gave an order for it to start without permission of the inspector on duty; and, being a special train, it should not have started without a telegraphic order. No collision occurred, for it was in the middle of the day, and the engine-drivers of the two trains saw each other and pulled up, not far from the site of the recent collision. He was not aware of any other irregularity in the starting of a train from either end, nor of any messages being sent irregularly by telegraph-clerks, or delivered in without signatures of inspectors. He had the most perfect confidence in the working of the present system, and his confidence was only shaken now by this accident. He believed the inspector did not carry out his duty. He ought in the first place to have signed the message calling the mail on from Brundall, if he intended it to go. He did not think an inspector would dictate a message intending it not to be sent until it received his signature. He might, possibly, being in a hurry, order the message to be sent, promising to return and sign it. He might expect the clerk to send the unsigned message if he were called away in a hurry. This was his opinion. He was not aware of messages being so sent, nor had he any reason to believe it had been done. From the very large and uncertain traffic passing over that portion of line, and coming from Yarmouth and Lowestoft, he felt it would be impossible to work that portion of line satisfactorily by the train-staff system. He knew of no other additional safeguard to the present system that could be used to advantage. The more heavy and variable the traffic, the more necessary it was to provide as far as possible perfect safeguards, and if such could not be applied, then the only other alternative was to double the line.

In this case, it being a frequent message to Brundall, he had no doubt an inspector would intend it to be sent though he did not sign it, but he would rather not express an opinion as to whether, in the event of a message being dictated or handed in without being signed, an inspector or telegraph-clerk should be held responsible in regard to it. The traffic between Lowestoft, Yarmouth, and Norwich was increasing, and was probably one-third more than it was 15 years ago. The passengers passing over that line must be counted by thousands. The traffic was very heavy. He was aware that Rule 142 (Appendix C.) had not been observed as regarded the second part of it, owing to the inconvenience of giving the order to the guard of a long train. The order, which was a printed form (Appendix D.), was now given to the engine-driver; and there was only a verbal communication to the guard.

The doubling to the East Norfolk junction was on account of the traffic of the East Norfolk line being added to that of the existing Norwich and Brundall line. A portion of the line between Reedham and Lowestoft was worked on the train-staff system, because direct trains ran so frequently between Reedham and Lowestoft and Yarmouth and Lowestoft. It was not worked on that system until the direct line between Yarmouth and Lowestoft was opened, and increased traffic thrown upon the section. It had been the custom for the last six or eight years to call on the mail from Brundall when the express was about 25 minutes late. It was only telegraphed from Brandon to Norwich when 15 minutes late. It might, of course, be always telegraphed in order that information might be afforded as to what time it was keeping. There is no such book in existence as that referred to in Rule 98 (Appendix E.) Since the taking off of the express train between Ely and Norwich the slow train had come in more irregularly.

The arrangements for working the telegraphs were described by *Mr. Henry Viney Draper*, superintendent of telegraphs for the district including Norwich, Peterboro', Cambridge, Lynn, Ipswich, and other places. He said he had been at Norwich in that capacity since 5th November 1870, and had been altogether 28 years in the telegraph service ; he was principally engaged on the line, but spent much of his time in the telegraph-office at the Thorpe station.

In altering the crossing of trains on this single line, the inspector came to the telegraph-window on the platform, which was conveniently situated for the purpose, and got the single-line book. He sometimes wrote in it the message to be sent himself, and sometimes he asked the clerk to do it for him. They sanctioned the clerk doing it for him, because the inspector was not always able to do it for himself. The message must then be signed by the inspector, but there were no written or printed instructions on the subject. His superior told him (the witness) to satisfy himself that any clerk employed for single-line messages must understand his duties before being allowed to transmit single-line messages. Those were his instructions when he first joined the department in 1870, and he had been told so many times since. When a clerk was appointed he considered whether he was capable of doing single-line duty. The clerks came as "good telegraphists," and worked for two weeks or more under the eye of the clerk in charge of the telegraph-office before they were entrusted with the sole responsibility of single line messages. It would be the duty of the telegraph-clerk to see the message duly signed by the inspector before accepting it for transmission. He had never in his life seen a single-line message sent before it was signed. If he saw such a message had been sent before having the sender's signature, he should very severely reprimand the clerk. When the message was signed it might be forwarded at once. The reply was received generally in from one to two minutes. As it was received it was written in the book, and put through the aperture below the window, and left there for the signature of the inspector to the reply-message. The inspector generally left the window for one, two, or three minutes, and came back to sign this. He had never known an inspector let any considerable period of time elapse before doing so. He must come to receive his reply-message before he could act upon it. There was a bell which could be rung from the telegraph-office. It was fixed outside under the arcade and above the platform, near the window of the office. It was specially used to call the inspectors ; when the station-master at Brundall wanted to cross a train out of the ordinary way, then the inspector came to see what was wanted. If the inspector did not come immediately the bell should be rung. In the event of a message from Norwich to Brundall having been sent, and the book with the reply having been placed in the wicket door, or left inside for the inspector's signature, the bell would not be rung for him, but the book would remain until he came back, even if he stayed away an hour. He considered that the telegraph-clerk had done his duty when he had placed the book, with the reply in it, within reach of the inspector at or inside the telegraph-window, and that it was not his duty to ring the bell to call the attention of the inspector to it. The clerk took his orders from the inspector on duty. It was the former's duty to send the message and receive the reply, but not to call the inspector afterwards. He believed this accident would have occurred even if the bell had been rung immediately for the inspector. If he had been in the office at the time he should have probably rung the bell for the inspector, though it would not be his duty. He was in the telegraph office about two hours after the accident occurred. Hubbard, the clerk in charge, was there, and Robson, but the latter was the only person who ought to have been there at 9.35, and no one else had any right there unless he came on business. He looked at the single-line book and found the following message in the book, now produced unsigned, "Send up mail train on to Norwich before the "9.10 p.m. down passenger train leaves Norwich. "Time received 9.24 p.m. Time sent 9.25 p.m."

He found also the following reply entered in the opposite page: "I will send the up mail train on to "Norwich before the 9.10 p.m. down passenger train "leaves Norwich. Signed, W. Platford. Time re-"ceived 9.25 p.m."

He said to Robson, "Robson, why have you not "carried out your instructions in getting the mes-"sage signed before sending it? You know the "importance of the matter as well as I do?"—He replied, "I am aware of it. Cooper, the night inspec-"tor, came to the wicket, dictated this message to me. "I wrote it down. Cooper left the wicket, saying he "would come and sign instantly." The witness re-joined, "Why did you not get it signed then? You "see the serious consequences of the affair, and the "trouble it is likely to bring you in." He replied again, "I see my error, I did it to oblige Cooper; I "never did such a thing before in my life."

Robson having sent an unsigned message might have rung for Cooper, but he could not say that he ought to have done so, even though he had sent an unsigned message, as he considered it to be the inspector's duty to return to the wicket to sign the message.

If an inspector told a telegraph-clerk to write a message he should consider he intended it to go though he did not sign it. He did not know of such a case having occurred before. He had never known an unsigned single-line message being given in before.

There were eight instruments in the Norwich (Thorpe) telegraph office, and the Yarmouth instrument (the third from the approach end), used for single-line messages, and also for other purposes, was an ordinary, double-needle speaking-instrument. A glass partition separated the lobby used by the public for sending messages from the office containing the instruments. There were no telegraphic means of stopping the trains when once the mistake had been made.

He had often called Robson's attention to the importance of getting messages signed, though he never knew him to omit this duty. Robson was once fined, about twelve months ago, for having a stranger in the office. Otherwise he had been most commendable in the discharge of his duties. He had been 14 or 15 months in the department at the Norwich (Thorpe) station. He (the witness) had watched him and could give him the best of characters. Robson was still doing duty in the office, but was not allowed to touch the single-line instruments.

Herbert Samuel Taylor, a telegraph-clerk in the employ of the Great Eastern Railway Company at Thorpe station for 16 months, said he took alternate duty with Robson. He was on duty alone in the night but not by day. He had sent single-line messages for the last 16 months. In sending single-line messages in the day the inspector himself most frequently wrote the message in the book, and at night

the clerk most frequently wrote for him. When the inspector wrote he signed at once. When the clerk wrote for him he was sometimes called away, and then the message waited until the inspector returned. He had waited as many as five minutes for an inspector to return and sign a message after he had dictated it. If the inspector did not return the message should lie where it was. He would not call the inspector or ring the bell. He confirmed the last witness as to its being their duty not to send a single-line message away without its being signed by the inspector on duty, and said he would not do so. He had been frequently cautioned by his superintendent not to send away such a message. He had worked the Newmarket single line at the Cambridge station on the same system before coming to Thorpe.

Mr. Sproule, station-master at Norwich (Thorpe) station for 16 years, said the number of trains running daily up and down between Norwich and Brundall averaged 15, he believed. There were ten up trains on Mondays and Saturdays and nine up trains on ordinary days. There were 11 down on Mondays and 12 down on Saturdays, and 10 on ordinary days. There were specials nearly every day, and fish trains in the fish season. At present these averaged about one up and one down daily, but in the fishing season they averaged more than three trains each way daily. The fishing season embraced October, November, and December. The express train, when more than 15 minutes late, was always telegraphed from Brandon, but no telegram was received for the express train, 5.0 p.m. from London, on the evening of the 10th September. He (witness) never interfered with the working of the single line as regarded the alteration of the crossing-places for trains. That was at Norwich the special duty of the inspectors—Parker by day and Cooper by night. If he were there they sometimes consulted him on the subject, but not as a matter of duty. He simply gave the general instructions, leaving the inspectors to carry them out. When an inspector wished to change the crossing-place he should go to the telegraph-wicket and ask for the single-line book, and enter in it the usual message sent on such occasions. They did not always write the message themselves, owing sometimes to the weather, but requested the telegraph-clerk to do so. He had not seen this happen so far as he could remember, but he knew it was done, having seen the messages written in a handwriting not the inspector's. They were invariably signed by the inspectors and handed to the telegraph-clerks, and he could not conceive an inspector omitting to do this. A message being signed was sent by the clerk, the inspector as a rule waiting to sign the reply. Occasionally, as he had seen happen many a time, the inspector went away upon some duty and returned to sign the reply. He (the witness) only dealt with the telegraph-clerks through their superintendent. They were not under his charge. If he had known an unsigned message had been sent he should have left the matter for inquiry. He had no hesitation in saying that he should blame the inspector for giving in an unsigned message more than a telegraph-clerk for receiving it, especially considering the difference of age and experience as between Robson and Cooper. It seemed to him utterly impossible that an inspector should ask a telegraph-clerk to write such a message not meaning it to go until it was signed, because the risk was so great, and because he had never known such a thing to have occurred previously. No trains of any description were allowed to leave the station without written authority being given to the engine-driver. The inspector wrote it himself and handed it himself to the engine-driver. They sent the booked trains forward without any telegraphic communication, and they might follow one another without notice of "line-clear" from Brundall, or of their having been despatched from Norwich. No special train could be started without a distinct order by telegraph. The bell outside the window of the telegraph-office had always, as far as he knew, been used for summoning the inspector to receive a single-line message from Brundall, and, he believed, occasionally for the receipt of an urgent message. On the receipt of an unsigned message the clerk should take no notice of it at all, or might ring the bell at his discretion and inquire what was meant. His best course would be to decline sending a message until it was signed. If he received such a message he should say, "There "is the message, I will send it when you have signed "it, but not till then." If the inspector wrote the message promising to come back and sign it, the clerk would not be justified in sending it without his signature. During the 16 years he had been at the Norwich station no alterations had been made in the system, except as regards the starting orders since 1872. They previously worked under the same system without the starting orders, except when trains were out of their course, for which they were always used. He always had confidence in the system. He knew of no difficulty in the relief of inspectors, and had seen them consult each other night and morning. (Rule 98 (Appendix E.) of the General Regulations provides for interchange of duty.) Inspector Parker had been on duty all day September 10th, and Inspector Cooper came on duty at 9 o'clock p.m. to relieve him. It was understood that Parker should remain to assist until the 9.10 p.m. train had left, though his duty had ceased. It had always been the custom for Parker to remain and start the down express, unless it was very late, but with the consent of the night inspector. Parker made no communication to him before starting the train. Cooper had been an inspector on the line at Thorpe station about 14 years, and had borne an excellent character. He never had a more careful man under his directions. Cooper was away ill about five weeks in May, June, and July 1869, and he received an injury to his hand last year which caused his absence from the 6th to the 20th of December.

Proceeding to the facts of the case, Mr. Sproule said that on the night in question he was in his office, which was next the telegraph-office, when Cooper came in to get his usual orders for the night at about 9.16 p.m., and said to him, "What about having the mail up, sir?" Witness looked at his watch which was right,—it was 9.17 p.m.,—and asked Cooper "What time the mail was "due at Brundall?" He replied, "9.25 p.m." Witness said, "We will not have the mail up, certainly "not." Cooper then remarked, "You know, sir, "there is an order allowing us to detain the 9.10 p.m. down train as late as 9.35." He said, "All right, we "will soon get her off." Cooper then left his office. He could not have been there more than two minutes. A few minutes afterwards, at 9.23, witness heard the down express run in under the arcade. In eight minutes, at 9.31, he saw the train start again while standing at the door of his office. He went in there again and heard some few minutes after a sharp click of the wicket-opening at the telegraph-window. He wondered and listened, and heard something about mail. He rushed out and said, "What about mail?" Cooper was then standing against the telegraph-window. He turned round, and had the appearance of a man paralysed, and said "I have ordered it up," or "the mail up," he was not sure which. He (the witness) was so unstrung that he hardly knew what took place. He felt for Cooper so much that he could hardly speak to him, but put the ticket collector, Hayden, in charge, he did not know at what time. He suspended Cooper some time early in the morning, feeling he was wrong. He knew that no other person could give the message for the train to come on. He had made no inquiry.

Mr. Sproule, having been recalled towards the close of the inquiry, was further examined, and said that Cooper came into his office at 9.17 p.m. that night. It would take him two or three minutes to look through his orders. It was impossible that he was ten minutes in doing so. He (witness) was engaged signing pay-sheets and letters during that time. He could not tell the exact time Cooper came into his office, for he did not look at his watch until he asked about the

mail. But it was quite true he came into his office and looked through the orders before he asked about the mail. He was very busy and hurriedly engaged signing pay-sheets and letters in order to get them away by the mail. He did not think it possible that more than three or four minutes could have elapsed before Cooper asked him about the mail. He saw Cooper come into his office. There would be about half a dozen orders, of about two or three lines each. Some of the orders would be addressed to Cooper himself, which he would read. He repeated that he told Cooper distinctly not to order the mail up. Cooper left the door of his office open, but he did not hear him say anything at the wicket. He could have heard anything spoken in an ordinary tone at the telegraph-wicket from his office, but that night was windy, and the wind might have prevented him from hearing. There was no one in his office between 9.6 and 9.20 except Cooper. He went on uninterruptedly signing when the latter came in.

William Parker (day inspector at the Thorpe station for 20 years) said that he came on duty on the 10th September at 9 a.m. he ordinarily left duty at 9.10 p.m. He first saw Inspector Cooper that evening at 9.24, one minute after the down express had run into the arcade. Witness had been assisting in collecting the tickets of that train and came on with it to the arrival platform, and there found Cooper. Knowing the train was late, he asked Cooper whether he had ordered the up mail on to Norwich; this was at 9.24. He replied, "Certainly not. "Let us get the train away as soon as possible." Perhaps a quarter before nine, but he could not say for certain, he wrote the order for starting the train. He wrote it then so as to have it in readiness in case the train should be in time. This was his usual practice. He did what he could in assisting to get the train away, and then handed the starting order to the engine-driver. He always did this himself; he said to the engine-driver on that occasion you have got to go to Brundall before the up mail arrives. Nothing else happened before he started the train. Cooper told him afterwards in conversation that he had gone to the wicket, and ordered the up mail train on to Norwich, about the time when the down train reached the ticket-platform; that he had remained near the wicket till he saw the down train run into the station; and that he had then gone back to the wicket and cancelled his previous message.

John Hayden, ticket-collector at Thorpe station, and 20 years in the service of the Great Eastern Railway Company, said that he, on the 10th September, also went to the ticket-platform at 8.50 p.m. and collected the tickets of the express which arrived at the ticket-platform at 9.18, and he rode in with the train to the arrival-platform and assisted the passengers out of the train. He saw Cooper and Parker on the arrival-platform assisting with the passengers and luggage. He heard nothing pass between the inspectors. Afterwards, when he was on the arrival-platform, he heard Cooper, who was standing near the telegraph-office, call out "I did not." He went across to the departure-platform, and saw him, and said, "What is the "matter?" He replied, "The mail is coming up." Witness said, "Good God! this will be a frightful "thing." After seeing Mr. Sproule, he called the men together and got them to light the lamps of the express-train carriages, and to go with Mr. Sproule to the scene of the accident, of which we had not heard, but which he expected to occur. Mr. Sproule when he left for the scene of accident told him to take charge of the station. When inspectors Parker or Cooper had been away he had very often taken their duty, and sent messages altering the crossing-places of trains. The process he adopted was to write the message himself in a single-line book. He did not remember to have ever asked a telegraph-clerk to write it for him, or know that the inspectors ever did so. Both this and the last witness said they always signed a message before sending it. It was against the rules to send one unsigned. He never sent a crossing order to an engine-driver, he always handed it to him himself.

Edward Trew, inspector of police for three years in the employ of the Great Eastern Railway Company, said his duties were solely police duties, and he knew nothing of the working of single lines. He was on duty at Thorpe station on the 10th September, about 9.30, and was at the telegraph-office window, and saw Robson inside the telegraph-office, standing against the wicket, so that the witness could not see anyone else in the office. Robson asked him if he knew where the down express was. He replied, "She has just left." Robson then said, "What, left the yard?" and seemed about to make an exclamation. Cooper came up hurriedly and said, "You have'nt ordered the mail "up, have you?" or "Don't order the mail up;" he was not sure which, but was inclined to think it was the former. Robson said, "Why you told me to "order her up." Cooper replied, "I distinctly told "you not to do so." Cooper then turned from the wicket to Inspector Parker, who was standing near, but whom witness had not seen before, and said, though he could not give his exact words, "They have ordered the mail up." Witness stopped to hear no more. He knew what must occur, and hurried away to make arrangements for the relief of the sufferers of whom he expected to hear.

John Bye, a shunter at Thorpe station, in the service of the Great Eastern Railway Company, said that he was at the station on the night of the accident, and about three minutes after the express had started Inspector Parker called to him and told him that Cooper had ordered up the mail from Brundall. This was the first he heard of it. He had occasionally taken crossing-orders from Inspector Parker to the engine-drivers, but never from Inspector Cooper.

William Turner, a passenger porter, said he heard Cooper tell Parker the mail had left. Cooper spoke first.

Thomas Browne, *John Barker*, *George Daynes*, *James Hart*, *George Balls*, *Samuel Platten*, and *Edward Chapman*, the other porters on duty at Norwich (Thorpe) station that night, added nothing important to the above evidence.

We come now to the evidence as to what transpired in the telegraph-office at the Norwich (Thorpe) station, which is amongst the most important evidence in the case.

John Keeble, for six years a clerk in the goods office, Thorpe station, in the service of the Great Eastern Railway Company, said that on the night of the accident he was in that telegraph-office. He went there about a quarter past nine, to speak to Robson, but he had no business of the Company to transact. He stayed there until about 9.33 p.m. About 9.22 there were several knocks at the wicket, which was fastened, and Robson went and opened it. Witness looked out, and saw Cooper, who had some conversation with Robson; and he remembered hearing the words, "Tell Brundall to send the "mail on to Norwich," and he said something more to Robson which he thought he heard at the time but did not remember even the substance of. Cooper then went away and Robson shut the wicket but did not fasten it. When he heard this conversation he was sitting on a chair on the right-hand side (looking towards the platform) of the wicket. Immediately Cooper left, Robson asked him to get up whilst he sat down and wrote out the message. He complied, and Robson sat down and wrote down the message directly. He asked witness the time as he could not see the clock, and he told him it was 9.23, but corrected at to 9.24.

Robson put that down, and sent his message to Brundall directly. He (Keeble) saw him send it. He did not understand the working of the instrument. The reply came back immediately, and Robson wrote it in the book at once. Nothing more occurred till a few minutes afterwards, when Inspector Trew came to the wicket and asked something about a message. He did not remember what. Robson went to the wicket to reply to Trew, and asked him where the express was. His words were, he believed, "Trew, where is the "express?" Trew answered, "It is gone." Robson then asked some other question which he did not remember. At that moment Cooper came up to the wicket again, and said something about the mail. He did not remember his words or the effect of them. He was on the point of leaving when Cooper came up the second time. He left the office and heard no more. He believed Robson was at the instrument when he left the office. He did not hear him say anything. Three persons only came into the office while he was there. These were William Banham, and John Holroyd, and some one he did not know (Charles Donkin). He thought Holroyd was a clerk somewhere, but had never seen him before that evening. Banham was formerly engaged in the telegraph-office. Holroyd and Banham were speaking to Robson part of the time. Holroyd and the one he did not know came in together. Banham went away after Cooper came to the wicket. When he (Keeble) got round to the platform Cooper and Robson were talking together. He did not remember what was said; or recollect whether Robson was alone or not when he went in to see him; nor was he sure whether Holroyd and the man he did not know were in Robson's office when he went in, but he thought they were and was sure no one else was there. Banham came into the office before Cooper came the first time to the wicket. He thought Holroyd and the one he did not know were in the office when Cooper first came to the wicket.

He was afterwards recalled, and said further:—He went into the telegraph office as he had before said. He spoke to Robson, he did not remember what he said. He was standing nearly all the time he was there, but not in one particular place. The first thing he noticed out of the common was Cooper knocking at the wicket, which was fastened by a book being placed to prevent it from being slid back. He was about two or three feet from the wicket and on the side of it on which the instruments were placed. When Cooper knocked at the wicket Robson moved the book away and opened the wicket. He passed Robson as he stood at the wicket and sat down on the chair between the platform-wall and the table. He distinctly heard Cooper say, "Tell Brundall to send the mail on to Nor-"wich." He was in a perfectly good position for hearing, but he did not remember now what else was said. Cooper afterwards went away, and Robson shut the wicket, and asked him to get up for him to write the message. He believed Robson had sent several messages while he was in the office. He might have gone to the Brundall instrument but he was not certain. Immediately after he spoke with Cooper, Robson took the book up from the shelf by the wicket, brought it and laid it down on the table, and asked him to get up and let him write in it, and he did this before he went to the Brundall instrument. He did not know why he asked him to move. He could not remember whether anyone was sitting on the other side of the table. He could not account for Robson's coming to sit on the chair he occupied, and turning him out for the purpose, unless it was because he always wrote on that chair. If Donkin said he was sitting in that chair it was not true. He did not see him sitting in it during the evening. Neither did he ask him to get up for him to pass by. When Robson wrote the message he stood close by the wicket. He only wrote one message, and that was on the left-hand side of the book. He asked him the time. He looked and thought it was 9.23., but now remembered that either Holroyd or Donkin said J. D. H., which meant in post-office telegraph-language 9.24. He believed they stood against the glass partition near the entrance to the office. He was certain the person who spoke did. He saw Robson write 9.24 in the book. He then sent the message to Brundall, and the reply came back immediately. He believed Robson then wrote the reply, going to the same chair and writing in the book. He could not tell whether Robson wrote on both pages, or on one page of the book. He did not on that occasion ask anyone to move from the chair. It was unoccupied. Witness did not remember having ever seen either Donkin or Holroyd before that night. After Cooper told Robson to send on the mail from Brundall, Robson shut the wicket before leaving it, but he did not fasten it. He did not think it could have been opened again without his noticing it. He did not see it opened again till Inspector Trew came. Inspector Trew opened the wicket himself. He (Keeble) was standing about the middle of the office. Trew asked Robson about a message. He did not remember what Robson was doing. He remembered Robson asking Trew where the express was. Trew answered, "It's gone." Robson then said something else to Trew. He believed it was, "What, left the yard?" Then Cooper came up and asked Robson something about the mail. He (Keeble) then left the office alone, and went on to the platform, because he knew something was wrong, and to see what it was. He knew Robson had ordered the mail up, and that the express had left. He saw Cooper at the wicket, but heard nothing. As soon as he got to the wicket Cooper went away. He asked Robson in at the wicket from the platform whether the mail had left, and he said "Yes." He had known Robson about three months. They did not live near each other. He saw him often during the week, and had seen him many times since the accident.

William James Banham, a law-clerk, occasionally employed by the Great Eastern Railway Company as telegraphic-messenger, confirmed the above statements as to the message and to its being sent. He said he did not remember that Cooper added anything more to it, or that there was any reply. Witness was standing about two yards from the wicket, close to the counter on which the telegraph-instruments were placed. He was there when Robson shut the wicket. The latter wrote the message in the usual book and called on the instruments. He worked the instruments for about a minute and seemed to be sending the message, and then seemed to receive a reply, for he went to the same book and wrote in it, but he did not see what he wrote. No interval elapsed between the shutting of the wicket and sending of the message. Robson then shut the book and placed it near the wicket. He had to get up, to reach round a small partition-board, and he placed the book on the shelf near the wicket-door inside the office. The wicket was then quite shut. No one else came to it. He stayed at the office four or five minutes after that, and then went away. No one but Keeble, Holroyd, and Donkin were there. There was no noise or talking whilst Robson worked the instrument.

Afterwards he was further examined, and said that on the night of the accident, about 9.20., he saw Cooper come to the wicket and say to Robson, "Tell "Brundall to send up the mail before the down train "leaves Norwich." He believed Keeble was sitting with his back to the platform-wall. Witness was standing between the wicket and the cupboard on which the instruments stood. Holroyd was standing near the entrance-door by the glass-partition, and he did not know where Donkin was. After Cooper gave in the message Robson shut the wicket, took the book, and wrote in it. Then he worked on the instrument, and returned and wrote in the book again. He could not say whether he wrote on two sides of the book, or on one side, before he went to the instrument. When he came back from the instrument he wrote only on his right side of the book. He could not say whether he wrote on the top of the book, the

middle of the book, or the bottom of the book, before he went to the instrument, or whether he wrote on the top of the book or the bottom of the book when he came back from the instrument. He did not hear him ask anybody the time, or see him write the time in the book. The wicket could not have been opened after Cooper first visited it without his seeing it. It was not opened again until he left the office at 9.28. When he first went into the office he asked Robson for his short-hand book, and, excepting that and perhaps another word or two more, he was talking to Keeble all the time. Their conversation was chiefly about telegraph-working, and he was trying to read off by the ear-taps which Keeble made on the table. Keeble was all this time on the chair inside the wicket against the platform-wall. Keeble resumed his seat after Robson had written in the book, and he was there when he left the office. When Robson wrote in the book Keeble stood near him. He (Banham) believed he saw Donkin sitting in the chair between the table and the wall for about a minute. He believed he got up to speak with Holroyd at the door. He sat on the other chair which was by the fire-place just after he entered the office. He got up from that chair to work one of the telegraph-instruments. That was before Cooper came to the wicket. A message was laid on the instrument in the usual place, and he was calling "Y. M." for Wymondham. He did not remember whether he received any reply from Wymondham, and it was then Keeble was tapping on the table. He believed Keeble was interrupted in his taps when Cooper knocked at the wicket, and that Keeble was tapping on the table both before and after Cooper came to the wicket. During part of the time Donkin was talking to Robson, and part of the time to Holroyd. Donkin was sitting in the chair between the table and the wall before Cooper came to the wicket. After Robson had written in the book he rose from the chair, and put the book round the little wooden partition on to the shelf. He (Banham) was now engaged in learning the duties in the telegraph-office at Thorpe station, but not at the time of the accident. He went away home after Cooper had given in the message. He heard him say no more.

John Holroyd, a clerk in the post-office since January 1870, said he went to the office at 9 or 9.10, and Keeble came in about 9.15. The next thing he saw was Cooper coming to the wicket, which was open, and speaking to Robson; but he did not hear what he said; he (witness) was standing against the door of the office. He saw Robson write in a book and send a message on the instruments, but he thought he sent the message first, and wrote in the book afterwards. He wrote in the book at the table on the right of the wicket, looking towards the platform. Witness was talking to Charles Donkin, standing near the door at the time. He did not see Robson write in the book more than once. He thought he wrote two messages down at once. He believed he wrote on the left-hand side of the book first, and then on the right-hand side, at the same sitting. He did not hear anyone ask the time at that moment. He was facing Robson as he wrote, and about a yard and half from the book. Witness left the office, and went out on the platform, when he saw it was 9.33 by the station clock. At about 9.30 he saw Cooper come to the wicket on the platform. Robson left the wicket and went to the instrument. He heard Cooper say, "Oh, my God!" and then he turned away, saying something else which he did not catch. He saw no one else at the wicket at that time, nor heard anything that Robson said. Robson ran to the instrument directly, but did not appear to send a fresh message, and was not there half a second. He could not see any other person outside on the platform if anyone stood in front of the wicket. He did not see Cooper after he first came to the wicket until he came again at 9.30, but he might have come without his seeing him. There was no larking at all in the office, and no one intefered with Robson in the performance of his duties. Donkin was there to see Robson about some lodgings. They were not on telegraph-duty; he accompanied Donkin, a friend of his; no one was there besides Robson, Banham, Keeble, Donkin, and himself.

He also was recalled and added that his only reason for going to the telegraph-office on the 10th September was to accompany Donkin. They reached the office between 9.0 and 9.10 p.m., and he sat down on the cupboard near the glass partition. He did not remember what Donkin did. The first thing that attracted his attention was the entrance of Keeble; he did not notice where he went to; he (Holroyd) was sitting on the cupboard doing nothing and saying nothing; he had not exchanged a word with Donkin about his evidence. He was in court yesterday when Donkin gave his evidence, but did not know, as he was unable to hear, all that he said. He saw Cooper come to the wicket, and saw Robson go to the wicket. He heard nothing and only saw Robson and Cooper; Robson left the wicket and went straight to the instrument. He thought he went to the third one from the cupboard on which he (witness) was sitting. He appeared to be sending a message, and then he left, and went to the table, and wrote something in a book. Robson sat down; he saw no one move for him. He sat on the chair between the table and the platform-wall. Some one might have moved without his seeing it. When Robson was at the instrument the second time he said, "Leave the office, leave the office." He supposed he intended that to apply to Donkin and him. They left directly, about 9.32. Keeble had gone out just before, and Banham five or ten minutes before. He did not see Inspector Trew come to the wicket, he could have come without his seeing him. He did not notice Donkin sitting at all. He spoke to him against the fire-place, they were then standing. He did not see what Robson wrote in the book. He saw him write at that sitting on both sides of the book.

Charles Donkin said he was a telegraph relief-clerk employed at the post office in Norwich. He was at the telegraph office at Thorpe station on the evening of the accident. He went there between 9.0 and 9.10 p.m. He went with Holroyd to speak to Robson in regard to lodging with him, and did so. He had known him about four months, and had occasionally called to see him. When he reached the office Robson was disengaged. Keeble and Banham were there. He had not seen Keeble before. He did not notice anything until 9.30 or 9.35, five minutes before he left. During the 20 minutes previously he saw Robson go to two or three instruments. He kept talking with Robson and Holroyd nearly all the time. The principal conversation was between Robson, Holroyd, and himself. It was chiefly about lodgings. About 9.30 he saw Robson go to the Brundall telegraph-instrument, and he supposed he was sending a message. He did not notice his writing in a book, nor did he see anyone come to the wicket to speak to him before he went to the instrument. He (witness) was sitting in the right-hand corner (looking towards the platform) of the office, and his back was turned to the platform. He was 1½ or 2 yards from the wicket, but there was a thin screen about 3 feet deep, and 12 or 18 inches wide, between him and the wicket. He was in a good position for hearing anything which Robson might have said, or for hearing anything that might have passed at the wicket. He did not hear anyone come to the wicket before Robson went to the instrument. After he went to the instrument witness rose from the place where he had been sitting. Holroyd was near the fire-place and he was speaking to him. Robson had pointed out the Brundall instrument to him before. He noticed the single-line message book on the table where he was sitting. Robson could not have gone to the instrument without first writing in the book unless he had seen it. He did not write in the book first. He did not see or hear anybody at the wicket before Robson went to the instrument. He [illegible] instrument and then go to [illegible] seemed to write two sentences [illegible] the book, and one sentence [illegible] He was sitting at the table [illegible]

him to tell Brundall to cancel his single-line message and stop the mail. When he looked at the clock it was 9.32. He knew there was no time to write the message in proper form in the book. He ran to the Brundall instrument, and told Brundall, "Stop mail." Brundall immediately replied, "Mail "left." He told Cooper what Brundall said, and asked him to sign the message and the reply. Cooper said, "No, I never gave you the message." He said, "Yes you did, or why, if you did not give me the message, do you now come back to cancel it?" He believed that was all that transpired between Cooper and him. The above was as nearly accurate as he could remember. He received the message at 9.24, and as the mail was due to leave Brundall at 9.25 he feared that he should delay it if he did not send off the message immediately.

He was waiting between 9.25 and 9.32 for Cooper to come back and sign the message. If he had rung the bell Cooper would have returned and "made a row" for being called away from his duty. The message never lay waiting for the inspectors' signatures. They might go away, but not for a minute, and they always came back and signed it before it was sent. When they did not come back to sign the reply, he sometimes rang the bell to call their attention to it, and that was when they complained. He did not use the bell on this occasion, for he was expecting Cooper's return every half minute. When he was sitting at the table, writing the message in the book, Holroyd was facing him, and was between the fire-place and the door. Before getting up the second time he wrote the message which he thought would be required, but was not sent. This would explain that he did write two messages on opposite sides of the book at the same sitting.

He also was recalled, and said further, after being again cautioned, that he was positive that Keeble was in the chair between the table and the platform-wall at 9.24, when Cooper came to the wicket, for he asked him to get up for him to write. He wrote the message on the top of the left-hand page before he went to the instrument; he then went to the instrument and sent the message, and received the reply, and then wrote the reply on the right-hand page, and then second the message on the left-hand page below the first message. He saw Donkin near the fire-place with Holroyd, but not near the chair between the platform-wall and the table.

He was then examined as to certain unsigned messages (Appendix F.) found in the single-line books. He accounted for the first unsigned message of February 12th, 1874, by supposing that Cooper might possibly have signed on the right-hand when sending the message, and returned to put the date to the reply. In the next case, May 1st, 1874, he wrote down the message as he read it off the instrument from Brundall, but had omitted apparently to put down the signature telegraphed. The two next cases witness had nothing to do with, as Mr. Hubbard had entered the messages. In the third case, which did not relate to him, Inspector Humphrey had dictated the message, but had not signed until he returned for the reply at 1.24 p.m., six minutes after the time the message was given in for transmission, when he had signed the reply only. In the fourth case, 24th August 1874, the message was sent and the reply received at the same time, 1.22, and the reply only was signed. It was perhaps explained by the inspector not thinking it necessary to sign twice in the same minute.

Alfred Cooper (who was also cautioned), said he was an inspector at the Norwich (Thorpe) station, in the service of the Great Eastern Railway Company, and had been so for 15 years. He had been in the habit all that time of sending what are called single-line messages. The responsibility of altering the crossing-places of trains on the single line had rested on him during that period when he had been on duty. His practice in regard to that duty had been to go to the wicket at the telegraph office, and sometimes, but very seldom, into the office. If he wanted a train sent forward from Brundall out of the ordinary course, he either wrote the message himself or asked the clerk to write it for him. It was very awkward sometimes writing messages himself, and he frequently asked the clerk to write them for him. In the case of the clerk's writing it, he (the witness) stood outside and waited till he had written it, and then signed it. He had sometimes asked the clerk to write the message, and then gone to make out the starting order, and returned to sign the book. He had never given an order for that train, and gone away without signing it. Sometimes he had been called away in the morning, and gone without completing a message, and had returned afterwards to sign it. He was not aware, and should have no means of knowing, whether in the meantime the message was despatched or not. He was not so liable to be called away from the wicket while sending a message in the evening as in the morning. His first duty when he came on of an evening was to attend to the express train from London and the mail from Yarmouth. When he had left a message unsigned, the clerks frequently had rung the bell for him to come and sign it. He believed he might have complained when they had rung the bell for him from the telegraph-office. They rang the bell commonly when they had a message for the inspector. On the 10th September, the express being late, and looking from the platform at the telegraph-wicket, and seeing that it had not come in, he opened the wicket, but did not knock at it, and said, "Mr. Robson, the "express is not in; we will have the mail up before "the down train leaves," or words to that effect. He said, "All right," and he (witness) stepped a pace or two backwards and forwards waiting to sign. He did not go away anywhere. He expected Robson to write out a message for him to sign. About half a minute after, or in less than a minute, he saw the express running in from the ticket-platform to the arcade. He went straight to the wicket, not having gone more than three yards from it since he had given in the message, and said, "Mr. Robson, don't "order the mail up. The express is running in; we "will get her away first." The wicket was open, and Robson was standing at the table facing him. He was not sure whether the wicket had been shut between the time of his giving in the message and the time of his cancelling it. He understood Robson to say, "All right, captain," which was what he used to call him. He then left the telegraph-wicket, and went to the arrival-platform at the opposite side of the station to assist with the express. Inspector Parker came to him, and asked if he had ordered the mail up. When the express was late he always asked the question. He replied, "No, sir; "certainly not," or "I have not. Let us get the train "away as soon as possible." This was done, and the express started at 9.31. He walked round to the telegraph-wicket again, to advise Reedham of the time the down train left Norwich, which is the practice when the train is 15 minutes late, and said to Robson that he wanted to send an "MT," *i.e.*, a train-message to Reedham. Before he could get the words out of his mouth, Robson said, "I have ordered the mail up." Witness said, "Good God, Robson, how dare you "order the mail up when I distinctly told you not to "do so." He said, "You did nothing of the kind." Witness said, "How dare you assert such a lie?" and added, "A lie stands for nothing." Robson had not time to write the message in the book before he cancelled it. When waiting to sign he did not see what was going on inside the office. He could not account at all for what Robson did. He thought he noticed three young men in the office when he handed in the message, but not when he cancelled it. He [illegible] the wicket was shut while he was [illegible] the wicket back to cancel the [illegible] talking in the telegraph-office [illegible] that night, he went

round and assisted with the passengers' luggage at the arrival-platform. He had no means of knowing when the train was at the ticket-platform. Mr. Sproule and he had spoken about the express being late, and it was in consequence of that he went to the wicket and gave the message. He did not know that he had ever had occasion to cancel a message before. He had before allowed the wicket to be shut whilst he was waiting to sign a message.

Afterwards he also was recalled and re-cautioned, and he made the following further statement. Before the arrival of the express, and about 9.6, he went into Mr. Sproule's office, and remained there until about 9.20 or 9.21, looking through the orders for the next day. He (Cooper) was standing in the office all that time looking through the orders. The orders related to the traffic-arrangements for the next morning. Mr. Sproule was there all the time. They were speaking about business, and with regard to the mail train he thought he spoke first about 9.20, and said the express was not in. They had had no advice about it, and he suggested the bringing up of the mail. His (Mr. Sproule's) words were, "You had better do so," or something to that effect. (It will be remembered that Mr. Sproule directly contradicted this, and said first that Cooper came to his office at 9.16 and afterwards that Cooper was not in his office more than three or four minutes.) He understood Mr. Sproule to assent to bringing up the mail. It was then he went to the wicket, and he believed he knocked at it. It was closed, and Robson opened it. He said to him "The express is not in. We had better have the mail up," or words to that effect. He then paced backwards and forwards waiting to sign the message for about half a minute or three-quarters of a minute and saw the express running in from the ticket-platform into the station; and he told Robson not to order the mail up as the express was running in. He understood him to reply, "All right, captain." He observed some one in the office on the first, but not on the second occasion. He closed the wicket, as he always did, because the wind was disagreeable to those inside. He did not inquire whether Robson had written the message as he did not think he had had time to do so.

William Platford, the station-master at Brundall, said he had been so for eight years and nine months. He had often to alter the crossing-places of trains during that time. In case of irregularity in a meeting train he telegraphed to Norwich to arrange accordingly. He sometimes signed a message before it was sent, sometimes afterwards. It all depended on the business. Sometimes he wrote a message, and sometimes instructed his clerk, Thomas Spicer, to do so. More frequently the latter did so, and sometimes his son, a lad of twelve years did so, whilst he was standing by, and then they would send the message. He never had allowed the calling on of the mail to be taken on the instrument by anyone but himself. He sent the message himself on the evening of the accident. He produced the book with the entry—

"Send the up mail train on to Norwich before the
" 9.10 p.m. down passenger train leaves Norwich.
" Signed A. Cooper. Time received 9.26."

He received this himself with the signature "A. Cooper" to it. If that signature had not been attached the train would never have been started. He replied, as noted in the book—

"I will send the up mail train on to Norwich before
" the 9.10 p.m. down passenger train leaves Norwich.
" Signed W. Platford. Time received 9.26."

The up mail drew into the station just after he had received that message and sent back the reply. He turned round from the instrument and saw the mail stopping at the platform. He wrote the order for the mail to start and gave it himself to the engine-driver. The mail then left at 9.28. After seeing the train leave, he stood watching the instrument, and at 9.33 received the message, "Stop up mail." He replied instantly, "Up mail has left." The next message he received was to block the line after the collision. He accounted for the absence of signatures to the single-line telegraph-messages in the book produced, partly by the clerk having omitted to copy them, and partly by people who had taken his place omitting to sign them, and partly by his not having thought it necessary to sign at the bottom of the message as well as on the opposite page. As he had charge of the telegraph-instruments, and also of the alteration of the crossing-places of the trains, it did not seem to him to be of the same importance that he should sign the messages in the book as at Norwich. He always telegraphed his signatures though he had not always entered them in the book. He had never received an unsigned message from Norwich. The train might wait for ever; and he would not send it off without the receipt of a signed message. His hours of duty were from 6.30 a.m. to 9.25 p.m. He was not hard at work all the time. He had a clerk and a porter, and was sometimes assisted by his son. He watched the latter. He gave no special notice as prescribed by the Rule 142, and quoted in the working time-bill, page 46, for September 1874, to the guard for the train to proceed. He only handed the usual starting-order on a printed form to the engine-driver, and this was his practice. Besides doing this, he informed both guards and the engine-driver verbally "You are going on before the 9.10 down train." He also said to the last guard, "Make haste and get the " train away." His books were inspected sometimes by Mr. Draper. The last inspection was less than twelve months ago. He resided in the station with his family.

Thomas Spicer and *William Platford* the younger confirmed the above evidence, and Spicer added that he accounted for the absence of signatures to some of the messages in the Brundall single-line book, by supposing he had been called away before he could sign, or had forgotten to do so. He was not on duty at the time of the accident.

Mr. Symonds, station-master at Brandon for 10 years, said the London express arrived at Brandon on the 10th of September at 7.48 p.m. and left at 7.51. It was due to leave at 7.40, and was therefore 11 minutes late. If the train was 15 minutes late he had orders to telegraph it forward. So that he did not telegraph it on the night of the accident.

Next follows the evidence of two guards, one from each train. The others were too much injured to be able to appear.

James Chapman, (passenger guard in the Great Eastern Railway Company's service for 13 years,) said he was guard from Lowestoft to Reedham with the 8.20 p.m. train for Norwich on the night of the accident. He joined the Yarmouth train at Reedham, and then became under-guard. His portion of the train consisted of one first-class, two second-class, two third-class carriages, and one break-van. His van was placed next behind the Yarmouth train, and his carriages were behind his van. The Yarmouth train was in front of his train. He did not take the time at Brundall as he was not in charge. The station-master there told him they were going up before the down train. That was after they had been half a minute or a minute at the station. He told them to get away as soon as they could. It was raining at Brundall and all the time they were running till the accident occurred. It was very dark indeed. About two or three minutes after leaving Brundall he went to sit on the seat looking out of the window, and he noticed nothing till he felt the shock of the collision. He did not hear a break-whistle, neither did he feel a slackening of speed. His van was the first vehicle that escaped without being broken, except the window, which his arm went through. After the accident he went back to Brundall to protect his train.

George Read, passenger guard in the Great Eastern Railway Company's service, said he left London as head-guard with the five o'clock express. The train arrived at Cambridge at 6.33 p.m., three minutes late. They reached the ticket-platform at Norwich (Thorpe) 9.18, and the arrival-platform at 9.23. His train from Norwich was composed of two first-class, two composite, two second-class, five third-class carriages, two break-vans, and a horse-box. They left Cambridge, he believed, eight minutes late, from delay in attaching a horse-box. They lost a minute or two at Ely. On reaching Norwich, he rode down with Inspector Parker from the ticket-platform to the station. He asked him, " If they were " going down before the up mail arrived ?" He said " Yes, but he must see Cooper first." Nothing more passed between them. He was riding, when he left Norwich, in the tenth vehicle from the engine, and there were four vehicles behind his van. Parker was calling out at the last moment for some luggage belonging to Mr. Palmer, which was left in the cloak-room ; and that luggage was put in at the off side of the train by Barker the porter. It was just beginning to rain when they left Norwich, and it was very dark. He had turned a portmanteau on its end and was sitting on it, and had got out his book to see whether his value-book corresponded with the number of parcels in his van. As he was doing this he felt the shock of the collision. He had heard no whistle nor felt any slackening of speed. He was thrown down. They could not make up time between Wymondham and Norwich, there being only 14 minutes allowed for nine miles, and they did not do so.

John Phillips, an engine-driver in the service of the Company, proved that the engine of the Company, No. 285, which had drawn the express train on that evening from Cambridge to Norwich, and against which some complaints had been made, was in good working order.

Mr. William Adams said he was locomotive superintendent of the Great Eastern Railway, and had been so for about 15 months. He was previously locomotive superintendent of the North London Railway for nearly 20 years. He had visited the scene of the accident, and had ascertained from personal inspection that the engine-drivers of the two trains could, if the atmosphere had been clear, have seen each others head-lights for a distance of 320 yards as the trains approached one another. Even considering the weather, as described on the night of the accident, he believed they might have seen each other for that distance. They would both have been travelling at a speed of about 20 to 25 miles an hour. The train approaching Norwich would have had the steam of its engine shut off a little before that point, and the train from Norwich would hardly have got into speed. The engine of the train from Norwich had cylinders 15 inches in diameter with 24 inches stroke, outside the framing. The wheels were, four of them coupled, and were 5 feet 6 inches in diameter ; and the leading wheels were 3 feet 6 inches in diameter. The weight of the engine in running order would be 26 tons. It was No. 218, and was used for goods or passenger trains. The engine of the train from Yarmouth was No. 54, an express outside-cylinder engine, diameter of cylinders 16 by 24 inches stroke, single driving wheels 7 feet diameter, leading and trailing wheels 3 feet 6 inches in diameter; and the total weight was 30 tons. Both were tender-engines. When he saw the engines, the chimneys and smoke-boxes were destroyed, and the smoke-box tube-plates were laid bare. The cylinders were driven back and the framing was bent out. The framing was further bent so that the leading wheels of the express engine especially were thrown out of square. The hand-rails were broken away from the foot-plate. The tanks were knocked away from the under-framings of the tenders. There were 13 vehicles destroyed, and four damaged. The destroyed vehicles were a third-class, a composite, another composite, third, second, third, second, and a horse-box ; all these were in the train for Yarmouth. In the other train were two composites, a third-class, a mail van, and a composite. There were two break-vans to each train, with two guards, besides tender-breaks. He believed the engine-drivers saw each other as he found the steam shut off on both engines. He looked at the reversing-lever of No. 218 engine, and it was in mid gear. He believed also that the firemen of both engines had endeavoured to apply the tender-breaks. There were 14 vehicles in the train from Norwich, and 13 vehicles in the train from Yarmouth.

He went on to say that No. 291 engine took the London express from London to Cambridge, and No. 285 engine took the train from Cambridge to Norwich on the 10th September. These are both express engines, and in first class condition, having 7-feet driving-wheels. There was no truth in the allegation contained in the letter that one engine was inferior to the other.

Mr. William Cockrell Bardwell, a clerk in the office of the superintendent of the Great Eastern Railway Company in London, handed in a list (Appendix G.) of the sufferers by the collison. Up to that time 23* people had died, of whom 19 were passengers and four were servants of the Company working with the trains. Of the passengers killed only one was a servant of the Company. Altogether 73 passengers and two guards had been injured, besides the 23 who had died, so far as he had ascertained.

In Appendix H. will be found a return of the times of arrival of the down express and up mail trains in question, for the year ending 31st August 1874.

Conclusion.

This is the most serious collision between trains meeting one another on a single line of rails, if not the most serious railway catastrophe as regards the numbers of lives lost and serious injuries, that has yet been experienced in this country. In discussing the circumstances under which it occurred, it will be necessary first to consider the system adopted in the working of the line, and how far it was liable to break down in consequence of mistakes or misunderstandings on the part of the servants of the Company employed to carry it out ; secondly, to examine the immediate causes by which the accident was produced, and the blame to be attached to the servants of the Company implicated ; and thirdly, to consider the principles generally adopted in the working of single lines, and the means by which the risk of accidents of this nature may best be provided against. The system employed may, as will be observed from the evidence, be easily described. Referring to the particular portion of line in question, no engine-driver, whether running punctually or not, with a regular train or with a special train, was allowed to leave either Norwich or Brundall without instructions being handed to him on a printed form (Appendix D.) authorising him to proceed on his journey. The duty of formally starting the engine-driver in this manner devolved on the inspector on day or night duty at Norwich, and on the station-master at Brundall. So long as the trains were running punctually, according to properly-arranged working time-tables, there could of course, in no case, be any risk of such a collision. It was only when special trains were employed, or when there were alterations from the crossing-places laid down in the time-tables, that elements of risk were introduced. Before trains were allowed, in consequence of unpunctuality or otherwise, to cross each other at places not appointed in the working time-tables, telegraphic messages in simple forms always adhered to (Appendix F.), had to be exchanged between the two stations. At Brundall the responsibility rested on the station-master alone. It was his duty to work the telegraph-instruments, as

* There were two other deaths later, whilst this report was passing through the press.

well as to arrange for any alterations in the crossing-places of the trains. At Norwich this duty was divided between the inspector and the telegraph-clerk. It was the duty of the inspector to write, or to employ the telegraph-clerk to write, and when written to sign, any message on single-line business; it was the duty of the clerk to transmit such message when signed; and it was, further, the duty of the inspector to sign the reply, without which the message was not considered complete, and which, when properly received, indicated that it had been well understood. So long as this system was strictly adhered to, no collision between meeting trains could be expected to occur; but there was clearly, in the event of any laxity of practice, less liability to mistake at Brundall, where one man was responsible for the whole arrangement, than at Norwich, where the duty of making and completing the arrangement, and of transmitting the message, was divided between an inspector and a telegraph-clerk. But even at Norwich, there was little, if any, risk of mistake, if the inspector took care that no change of crossing-places was permitted without a proper message, signed by himself, being entered in the telegraph-book for transmission, and a proper reply, also signed by himself, being received to show that it was understood; and if he, at the same time, acted in accordance with any arrangement he had thus made through the telegraph-clerk with Brundall.

As regards this particular case, there appears to have been a misunderstanding in the first place between the station-master, Mr. Sproule, and Cooper, the inspector, as to whether, the express train being late, the mail train should be ordered up from Brundall. Mr. Sproule believes that, whilst engaged in signing letters and pay-sheets, he said "Certainly not" in reply to Cooper's suggestion. Cooper says he understood him to assent to the suggestion, and went straight from Mr. Sproule's office to the telegraph-window and acted upon it. Whatever be the truth of this matter, no danger ought, however, to have arisen in consequence of such a misunderstanding. The rules and practice in regard to the working of the single line ought in either event to have been sufficient to prevent the risk of any accident.

The blame as regards the immediate causes of the collision lies clearly between Inspector Cooper and Telegraph-clerk Robson. The evidence as to what passed between them rests mainly on their own statements, and they contradict each other in important particulars. It is difficult to believe that Inspector Cooper would, almost immediately after leaving the telegraph-window, have informed Inspector Parker that he had not ordered the mail train up from Brundall, and that the express train might be started from Norwich, unless he had at that moment felt satisfied that the message which (according to his own statement) he directed Robson to prepare at 9.21, had either been delayed for want of his signature, or had been cancelled. And it is equally difficult to believe that if Robson had heard and understood Cooper to tell him, (as Cooper states he did), to cancel the message, and had replied "All right, captain," he would, if he had previously transmitted the message, have failed to cancel it, or would afterwards have transmitted it in spite of its having been cancelled. It is evident there was a mistake or misunderstanding between Cooper and Robson, and that both were to blame. Cooper admittedly directed Robson to order the mail train forward from Brundall; and, having once done so, he ought to have made very certain, either that the message was not sent, or that it was cancelled, and that no doubt could exist on the subject, before he permitted Inspector Parker to start the express train from Norwich. It is true that he had not signed the message, that it ought not to have been transmitted without his signature, and that he might suppose that even if it had been transmitted without his signature, it ought not to have been acted upon at Brundall; but he should have taken care that on a subject of such vital importance there could be no possibility of a mistake. Having once given an instruction for bringing the mail train forward from Brundall, he ought to have clearly ascertained whether the message had been written in the book, whether it had been forwarded, and whether, if so, the usual reply to it had been received; and he ought to have made quite certain that no chance of error could exist, that it was struck out if written in the book and not transmitted, or that it was cancelled by a second message if it had been transmitted before the express train left Norwich. But, as qualifying these remarks, the excuse which Cooper has made, to the effect that he did not more formally cancel the message which was so unfortunately transmitted to Brundall because he did not think there had been time for either writing it in the book or transmitting it, must not be overlooked; and Robson's statement, that Cooper did not cancel the order for the message at all, must also be remembered.

The Telegraph-clerk, Robson, admits, as in fact his book shows, that he forwarded, on Cooper's verbal instructions, an unsigned message to Brundall, that the reply was at once returned from Brundall, and that thus the arrangement was complete for bringing up the mail train from Brundall at 9.26 p.m. And yet he waited for six minutes, until 9.32 p.m., without taking any steps to call Cooper, and to make him sign the message and reply, both of which ought to have received his signature. He had a bell at hand which he might have rung at any moment, and which would no doubt have brought an inspector, if not also the station-master, from the next office, quickly to his window. But he made no use of it, and it was only, according to his own account, when the Inspector of Police (Trew) came on other business to the telegraph-window at 9.32 p.m., that he made an inquiry concerning the express train, and ascertained that during those important six minutes it had run into the station, had started again for Brundall, and was probably about to come in collision with the mail, which was due to leave Brundall at 9.25, and which appears to have left that station, by Norwich time, at 9.27. In order to understand the gravity of his fault in sending an unsigned message, it must further be remembered that he forwarded to Brundall as if it had been received, a signature which had never been attached by Cooper to the message. And there is an important discrepancy in the statements of the witnesses present in the telegraph-office. One of them affirmed that Robson sent not only an unsigned, but also an unwritten message to Brundall on a verbal order from Cooper, and afterwards wrote in the single-line book the message, the reply to it, and a third message in anticipation of its being required. The time occupied in sending the message to Brundall and receiving the reply would account also for the difference between 9.21, when Cooper states he first went to the wicket, and 9.23 or 9.24, when, as the book shows, Robson commenced to write his entries in it. If Robson had never, as he states, previously sent an unwritten or unsigned message, it is difficult to understand how he could possibly rest in his office for those six minutes without taking measures for calling Cooper to sign the message and the reply which he had received to it. And the more so as he had at his hand a bell-cord, which he could easily have employed for the purpose. His excuse for not using it, — because he feared that Cooper might complain, or as he expressed it, might "make a row," and say he had rung the bell unnecessarily,—cannot be considered valid, when the case was so vital and the risk so imminent. He must, apparently, have been transmitting the message to Brundall two minutes after the express train entered the Norwich station, and, say two minutes before the mail train left Brundall. By ringing the bell to ask for Cooper's singature, even after he had sent the message and received the reply from Brundall, he might probably, by calling attention to the message, have shown Cooper the danger of starting the

express train at 9.31, and thus have prevented the collision, even supposing he had not heard him cancel the order for the message. But at this time there were no less than four other young men with him, against orders, in the telegraph-office, whose presence might naturally tend to divert his attention from his duties.

To sum up the case, as between Cooper and Robson, the blame must apparently attach to them respectively as follows:—Cooper, after directing the fatal message to be sent, though it is true he did not sign it, and it ought not to have been sent, or to have been acted upon if sent, without his signature, failed to take such subsequent measures as should prevent the possibility of a mistake, and make certain that there was no misunderstanding in the matter before he allowed Parker to start the express train from Norwich. As an experienced and responsible officer such precautions might reasonably be expected from him. Robson forwarded to Brundall as signed an unsigned, and apparently an unwritten message, which was, he admits, against his instructions, and which he at first stated he had never done before; and he received a reply to it by which the message was, so far as Brundall was concerned, perfected and completed. He then allowed six minutes to elapse without calling Cooper's attention to the fact that he had done so, whilst the express train was entering and leaving the station for Brundall, taking no trouble to prevent misunderstanding on a matter of such vital importance. Robson was further to blame in allowing four young men to be in the office where he ought to have been alone. Though he was not 18 years old, he had for upwards of 14 months been employed on the same duty, and he is a young man of great intelligence and apparently of good education.

Out of 16,082 miles of railway open for traffic in the United Kingdom, there were 7,395 miles of single line at the end of 1873, as returned by the Companies to the Board of Trade; and the various portions of single line making up the above total are worked under different systems, and under a variety of instructions, according to circumstances, and the ideas of the officers of the companies. But the principles involved are few in number. Many years ago the collisions which occurred from trains meeting one another in consequence of mistakes in the working of single lines by telegraph, led to the invention and adoption on many lines of the train-staff system; and it may be said, after considerable experience in the working of that system, that it has been attended with great, though not with entire success, as a means of preventing accidents from trains meeting each other. When train-tickets are used with the train-staff, there is still a liability to collision from trains following one another; but when the train-staff only is employed, and when no engine or train is allowed to pass along a section of line unless it is accompanied by the train-staff appertaining to that section, then the risk of misunderstandings or mistakes is apparently reduced to a minimum. The safest mode of working a single line that has yet been devised is believed to be a combination of train-staff and block-telegraph. With the double check of the staff and the telegraph, there must be an extraordinary combination of mistakes by several persons to produce a collision from trains meeting one another from any two stations. But, unfortunately, increased safety is purchased under such a system at some expense of freedom and convenience in working. And this is especially the case where the traffic is irregular and considerable, and where long continuous portions of single line have to be worked. In such cases other means have been adopted to effect that object. For instance, the station-masters, or persons in charge of the stations, are not of themselves allowed on some lines to alter the crossing-places of trains with each other, and can only do so under instructions from an officer of the Company specially appointed to that duty. This officer, called a train-despatcher, knowing from day to day by telegraph how all the trains on his line are running, is able, with or without the aid of diagrams, according to circumstances, to direct their movements; and the station-masters, or persons in charge of the different stations, are simply required to obey his instructions—either to send the trains on, or to stop them, or to see that any two trains cross each other, or pass each other at his station, as the train-despatcher may direct. This system is in operation on the continent of America over continuous lengths of single line for hundreds and hundreds of miles, the lines being divided into sections, with train-despatchers constantly employed on this duty, and having no other duty to perform, in central positions on each section, and it is also employed on considerable lengths of line in this country. But none of these systems, except perhaps the combination of block-telegraph and train-staff, have been worked with entire freedom from accident. Collisions have occurred frequently in working single lines under different systems by telegraph, not only when station-masters and others have been allowed to arrange with each other for the alteration of crossing-places or passing-places, but also when such alterations have been made under special instructions from specially-appointed or superior officers. Collisions have also occurred on lines worked under the train-staff system—in one case, when the superintendent of a railway, with his directors in a train, himself violated the train-staff regulations; and collisions may occur under any system that can be devised. Whatever checks may be established with a view to the avoidance, as far as possible, of mistakes and misunderstandings, it is necessary to work with human agents, and there is unfortunately, a tendency, after working for a length of time securely under any system to laxity of practice on the part of employés. They gradually acquire too much confidence in themselves and in their system. They cease to remember the importance of the checks or safeguards by which it is guarded. They fail while engaged in their daily routine of duties to realize the risks that may be incurred by a departure from strict rules, fixed practices, and prescribed forms; and they only awake to the necessity for yielding themselves and requiring from others absolute adherence to rules and practice after some serious warning or disastrous experience. The only mode of avoiding laxity of this description is by the maintenance of rigid discipline, by constant, efficient, and irregular supervision. The occurrence of an accident, and even of a very serious accident, under any particular system should not be taken without full consideration of all the circumstances to be positive proof against that system. And it must always be remembered, as the result of all experience in railway working, that an inferior system, under good discipline, leads to better results than a superior system without good discipline. On the occasion of so frightful an accident as the present, it is useful, with a view to the general knowledge and establishment of proper principles, and in order to obtain increased safety in the future, to recall and sum up such considerations; and it must not be overlooked with regard to this particular case that if only the inspectors at Norwich had, for instance, been in the habit of themselves writing the messages for altering the crossing-places of the trains, instead of employing, as they frequently did, the telegraph-clerks to write those messages for them, the safety of the traffic would not have been dependent upon a verbal arrangement, or at all events there would have been less liabitity to any mistake or misunderstanding, and this collision would probably never have occurred. The important lesson, then, to be learnt from the circumstances of this most deplorable collision is, not so much that one system of single-line working is superior to any other system as that, whatever the system by which safety is sought to be secured, it should be fenced about with safeguards precisely expressed and carefully observed. That system may,

however, be considered the best which can only fail under the most glaring disregard of detailed instructions, and under which advantage is taken of the improbability of several persons simultaneously concurring in the same neglect or mistake.

It is satisfactory to be able to add, in conclusion, that the Company propose to open a second line of rails to the East Norfolk junction, 1⅜ miles from Norwich, during the month of October; and then to work the line between the East Norfolk junction and Brundall, as long as it remains single, by the combined train-staff and block-telegraph system.

I have, &c.

H. W. TYLER.

I concur in the above report.

W. W. RAVENHILL.

The Secretary,
(Railway Department),
Board of Trade.

DIAGRAM Nº 1.

To accompany Captain Tyler's Report

dated the 30th September, 1874

APPENDIX A.

GREAT EASTERN RAILWAY.

Superintendent's Office,
Bishopsgate Station,
August 28th, 1872.

Special Order, No. 1501.

WYMONDHAM and WELLS, NORWICH and YARMOUTH and REEDHAM and LOWESTOFT.—Single-line working.

Commencing 1st September, 1872, engine-drivers of all ordinary trains (whether running to time or not), as well as of all special trains, passing over the single lines between Wymondham and Wells, between Norwich and Yarmouth, and between Reedham and Lowestoft, are to be furnished by the station-master or other in charge, with a written order, authorising him to proceed to the next passing or terminal station, as the case may be; and the driver will be responsible in each case for having such authority before passing over the single line, and for delivering up the order on arrival at the station to which he is authorised by it to proceed.

JAMES ROBERTSON,
Superintendent.

APPENDIX B.

Bishopsgate,
A. 9486. November 21st, 1872.

DEAR SIR,

8.40 p.m. mail train ex. Yarmouth to London.

IF from information you receive from Wymondham, or other station higher up, you arrive at the conclusion that you cannot start the down Yarmouth train from Norwich before 9.35 p.m., arrange to let the mail train come on from Brundall without delay, to pass the down train at Norwich.

In the event of detention to the up mail by reason of starting the down train from Norwich late, every means must be used at Norwich to expedite the departure of the mail and to keep the load of the train as low as possible, so that the time to Ely being ample, the time lost up to Norwich may be recovered. The point of most importance as regards the mail is that it should arrive at Ely to time.

I shall be glad by your having the working of the night mail train both up and down at the stations on your district looked into; latterly we have had delays.

Yours truly,
(Signed) JAMES ROBERTSON.

Mr. Stephenson,
District Superintendent,
Norwich.

APPENDIX C.

RULE 142 OF THE COMPANY'S GENERAL REGULATIONS.

Single-line railways provided with telegraph communication.

When from accident or any other cause a train is prevented from reaching the station appointed for it to pass a train from the opposite direction, the guard, after arranging for the necessary signals, must go himself, or forward *written* instructions by some competent person to the nearest station, stating the particulars of the detention; and the station-master, on receipt of such communication, must arrange by *telegraph* for the passage of the trains, and summons assistance from the nearest depôt.

All special trains and engines must be worked under telegraph orders, and in case of irregularity with a regular train the meeting station, as fixed in staff time bill, can only be changed by a telegraphic order being obtained from the station at which it is intended for the train so sent on to pass the one coming from the opposite direction. This order must be given to the guard, who will hand copy to the engineman, and both guard and engineman must satisfy themselves by reading the order that proper arrangement has been made for the trains to proceed.

No special train or engine must be permitted to leave a station at such a time as will prevent its arrival at the next shunting station at least 15 minutes before the time of a regular train being due from the opposite direction at that shunting station.

EXTRACT from Company's Working Time Tables, p. 46.

NOTE.—The trains on this single line are worked in accordance with Rule No. 142 of the General Regulation Book.—*The figures under which a bar thus —— is placed show where trains from opposite directions are to pass each other on the single line. In case of irregularity with a regular train, the meeting station, as fixed by this bill, can only be changed by a telegraphic order being first obtained from the station at which the train to be sent on is to pass the train coming from the opposite direction, and the guard and engine-driver must both satisfy themselves, by reading the order so obtained, that proper arrangement has been made for the train to proceed. All special trains and engines are to be worked under telegraphic orders. All telegraphic notices respecting special trains must state the number of the engine.*

In the event of the failure of the telegraph from any cause, no special train is to be run, and the ordinary trains are to be worked strictly in accordance with the working time tables; that is, no train is to be allowed to leave a single-line station until all trains due from the opposite direction have arrived. Ordinary trains as regards order of running are to stand as numbered in the time tables of this single line until cancelled, either by their passing over the single line or by written message between the stations at each end of the single-line section. Trains entered in the special weekly working time bills are on this single line to be treated as special trains.

APPENDIX D.

FORM OF STARTING ORDER.

[88] GREAT EASTERN RAILWAY.
35428 ——.

_____ Branch.

This is to authorise the driver of engine No. with the train from station, to proceed to station, where a train is appointed to pass from the opposite direction.

_____ 187 .

Signed _____
Station Clerk.

GREAT EASTERN RAILWAY.
——

_____ Branch.

This is to authorise the driver of engine No. with the train from station, to proceed to station, where a train is appointed to pass from the opposite direction.

_____ 187 .

Signed _____
Station Clerk.

APPENDIX E.

RULE 98 OF THE COMPANY'S GENERAL REGULATIONS.

On the exchange of duties between the day and night staff, all circumstances which may have occurred out of the ordinary course of duty, such as the signal for a special train following, or any accident on the line, or telegraph message requiring attention, must be carefully reported in a book to be kept for that purpose, and also communicated to the relieving staff prior to each man taking charge of the duties allotted to him.

APPENDIX F.

The following are the apparent irregularities and specimens of cancelled messages in the single-line messages taken from the following books:—1st book, August 17th, 1873, to January 31st, 1874, inclusive; 2nd book, Jan. 31st, 1874, to August 8th, 1874, inclusive; 3rd book, August 8th, 1874, to September 11th, 1874, inclusive.

Single-Line Train Messages.

Date, Thursday, September 10th, 1874.

Time received.	Station from.	Subject of Message.	Stations telegraphed.	Time sent.	Telegraph Clerk's Signature.	Subject of Answer.	Time received.	Telegraph Clerk's Initials.	Railway Officer's Signature and Time delivered.
9.24* p.m.	—	Send up mail train on to Norwich before the 9.10 p.m. down passenger train leaves Norwich.	Brundall -	9.25	R.	I will send the up mail train on to Norwich before the 9.10 p.m. down pass. train leaves Norwich. W. Platford.	9.25	R.	—
		When the up mail train has arrived at Norwich will line be clear for 9.10 p.m. down passenger train to Brundall?	Brundall -						

N.B.—The above are the messages entered in the book on the evening of the collision.
* Altered from 9.23.

Norwich, Thorpe Station, Sept. 10th, 1874.

9.32 p.m. Norwich to Brundall. "Stop Mail."
9.32 p.m. Brundall to Norwich. "Mail left."

Date, Thursday, February 12th, 1874.

7.41 a.m.	—	May spl. ballast train follow 7.50 a.m. down mixed train to Thorpe Bridges and bk.?	U.L.	7.42	R.	Yes, special ballast train may follow 7.50 a.m. down mixed train to Thorpe Bridges and bk. W. Platford.	7.43	R.	A. Cooper, 7.45 a.m.

Date, Friday, May 1st, 1874.

3.39 p.m.	U.L.	Is line clear for special fish train, engine 214?	Brundall -	3.45	R.	Yes, line is clear for special fish train, engine 214. W. Parker.	3.45	R.	W. Parker, 3.45 p.m.

Date, Tuesday, August 11th, 1874

1.18 p.m.	—	Ballast train is back, and line is clear.	Brundall -	1.20	G. H.	Noted. W. Platford.	1.20	G. H.	W. Humphrey, 1.24 p.m.

Date, Monday, August 24th, 1874.

1.20 p.m.		Ballast train is back, and line is clear.	Brundall -	1.22	G. H.	Noted. J. Lawrence.	1.22	G. H.	W. Parker.

Date, December 3rd, 1873.

Dec. 3 1873. *Cancelled.*	—	On arrival of 6.0a.m. up passenger train × Yarmouth will line be clear for special goods train, engine 320?	*Note.*—This is in Robson's handwriting.						

Date, Saturday, April 25th, 1874.

6.20 a.m.	—	May special ballast train, engine 355, follow special goods train, engine 325, to Brundall?	Brundall -	—	—	*Cancelled*, 6.23 a.m. A. Cooper.	—	—	—

SINGLE-LINE TRAIN MESSAGES—*continued.*

Time received.	Station from.	Subject of Message.	Stations telegraphed.	Time sent.	Telegraph Clerk's Signature.	Subject of Answer.	Time received.	Telegraph Clerk's Initials.	Railway Officer's Signature and Time delivered.
			Wednesday, June 24th, 1874.						
12.17	—	Ballast train is back, line is clear. J. HAYDEN.	*Cancelled*, 2.28 R.	—	—	*Cancelled*, 2.28	—	—	W. Parker, 2.30
12.17	—	Is line clear for special ballast train, engine 428, to Brundall?	*Cancelled*, 2.28 R.	—	—	*Cancelled*. 2.28	—	-	W. Parker, 2.30
9.14 (Oct. 4) 1873.	U. L.	Send 9.10 p.m. down passenger train on to Brundall before 7.40 p.m. up Ltoft. goods train leaves Brundall. C. EASTAUGH.	Brundall -	—	—	Inspector Cooper refused to sign for 9.14 single line. J. ROBSON.	—	—	—
9.4 (Oct. 25) 1873.	Bal.	Send 9.10 p.m. down passenger train on to Brundall before 7.40 p.m. up Lowestoft goods leaves Brundall. W. PLATFORD.	—	—	—	——	—	—	—
9.19	J. R.	Cancel your single-line order and send up mail train on to Norwich before the 9.10 p.m. down passenger train leaves Norwich. A. COOPER. (This message is in Cooper's own handwriting).	Brundall -	9.20	J. R.	I will send up mail train on to Norwich before 9.10 p.m. down passenger train leaves Norwich. W. PLATFORD.	9.20	J. R.	A. Cooper. 9.21 p.m.
(Oct. 31) 1873.	—	May special material train go to Thorpe Bridges and back? I will advise you when line is clear. W. PARKER.	*Brundall - *(*Note.*–This word appears to have been written by Parker.)	—	—	*Cancelled* by Inspr. Parker, 3.5 p.m.	—	—	—
(Nov. 8) 1873. 9.8 p.m.	—	Send the 9.10 p.m. down passenger train on to Brundall before the 7.40 up Lowestoft goods train leaves Brundall. W. PLATFORD.	Brundall -		H. S. T.	*Cancel your single-line order and * (*Note.* — Apparently Cooper's handwriting.)	—	—	—
9.22 p.m.	—	Cancel your single-line order and send up mail train on to Norwich before the 9.10 p.m. down passenger train leaves Norwich. A. COOPER.	Brundall -	9.24	H. S. T.	I will send up mail train on to Norwich before the 9.10 p.m. down passenger train leaves Norwich. W. PLATFORD.	9.25	H. S. T.	A. Cooper, 9.31 p.m.
—	—	Send up mail train on to Norwich before the 9.10 p.m. down passenger train leaves Norwich. COOPER.	—	—	—	——	—	—	—

SINGLE-LINE TRAIN MESSAGES—*continued.*

Time received.	Station from.	Subject of Message.	Stations telegraphed.	Time sent.	Telegraph Clerk's Signature.	Subject of Answer.	Time received.	Telegraph Clerk's Initials.	Railway Officer's Signature and Time delivered.
9.20 Sept. [illegible] 1874.	—	When up mail train has arrived at Norwich, will line be clear for 9.10 p.m. down passenger train to Brundall? A. COOPER.	Brundall -	9.25	J. R.	I will send up mail train on to Norwich before the 9.10 p.m. down passenger train leaves Norwich; and when up mail train has arrived at Norwh., line will be clear for 9.10 down train to Brundall. W. PLATFORD.	9.28	R.	A. Cooper, 9.29 p.m.

Date, Saturday, August 8th, 1874.

Time received.	Station from.	Subject of Message.	Stations telegraphed.	Time sent.	Telegraph Clerk's Signature.	Subject of Answer.	Time received.	Telegraph Clerk's Initials.	Railway Officer's Signature and Time delivered.
9.2[illegible] p.m. Aug. 8		Send up mail train on to Norwich before the 9.10 p.m. down passenger train leaves Norwich and when up mail train has arrived at Norwich, will line be clear for 9.10 p.m. down passenger train to Brundall? A. COOPER.	Brundall -	9.24	H. S. T.	I will send up mail train on to Norwich before the 9.10 p.m. down passenger train leaves Norwich; and when up mail train has arrived at Norwich, line will be clear for 9.10 p.m. down passenger train to Brundall. W. PLATFORD.	9.26	H. S. T.	A. Cooper, 9.28 p.m.
9.2[illegible] p.m. Aug. [illegible]	—	Same as above. A. COOPER.	Brundall -	9.27	H. S. T.	Same as above. W. PLATFORD.	9.28	H. S. T.	A. Cooper, 9.30 p.m.
9.24 p.m. Aug. 29	—	Same as above. A. COOPER.	Brundall -	9.25	H. S. T.	Same as above. W. PLATFORD.	9.26	H. S. T.	A. Cooper, 9.28 p.m.
9.[illegible] p.m. Aug. [illegible]	—	Same as above. A. COOPER.	U. L. -	9.20	R.	Same as above. W. PLATFORD.	9.21	R.	A. Cooper, 9.22 p.m.

APPENDIX G

GREAT EASTERN RAILWAY

Collision at Thorpe, on Thursday, 10th September 1874, between the [illegible] p.m. express train from Norwich and the 8.40 p.m. mail train from Yarmouth.

LIST OF PERSONS KILLED AND INJURED.

Killed.

John Prior, engine-driver, Great Eastern Railway.
Thomas Clarke, engine-driver, Great Eastern Railway.
James Light, fireman, Great Eastern Railway.
F. Sewell, fireman, Great Eastern Railway.
George Page, Norwich, leather-seller.
[illegible] Womack, Norwich, butcher.
Rev. Henry Stacey, Norwich.
Mrs. Stacey, Norwich.
Sergeant-Major Cassell, Norwich, West Norfolk Militia.
Sergeant Ward, Norwich, West Norfolk Militia.
Susan Lambert, Norwich, housemaid.
Miss M. Murray, Norwich.
Mr. Skinner, Norwich, gentleman.
Miss Turner, Norwich, forewoman at Mr. [illegible]'s draper.
Mrs. [illegible], Mile End Road, London.
Flora [illegible], Mile End Road, London, daughter of the above.
John Betts, stoker, Great Eastern Railway.
Mrs. Betts, wife of above.
Infant child of Mr. and Mrs. Betts.
Susan Browne, Norwich, seamstress.
Mr. Houston, Great Yarmouth.
Mr. Single, Regent Street, London, auctioneer.
Dr. [illegible] Francis, Norwich, surgeon, &c.

Total killed, 25.*

Injured.

William Baker, Horsford, contusions.
Mrs. Coote, London, compound fracture of leg.*
Miss Coote, London, injured head.
Jane Faulkner, Norwich, both legs fractured.
Sarah Gibbs, Norwich, fractured leg.
Elizabeth Bailey, Norwich, injured ankle and back.
Sarah Woodcock, Norwich, fractured leg.
Elizabeth Smith, London, fractured thigh.
Mrs. [illegible], [illegible], bruised head.
William Sayers, Horsford, broken leg.
Robert Sayers, Horsford, fractured leg.
Henry Robb, Norwich, fractured ribs.
William Stevens, Norwich, fractured ribs, &c.
John Bear, Alford, amputated arm.*
F. W. Dendy, Redhill, contusions.
Miss Chapman, Norwich, severely shaken.
Jane Wright, Norwich, shaken.
Mr. Dimmock, Norwich, injured wrist.
Miss Jones, Norwich, shaken.
Mr. Livingstone, Stowmarket, bruised face, &c.
Mr. Johnson, Stowmarket, fractured rib.
Mr. Scott, Norwich, injured legs.
Miss Dobson, Norwich, shaken.
Mr. Hardiment, Norwich, injured legs, &c.
Mrs. Burnside, Norwich, injured nose and face.
Mr. Brown, Yarmouth, injured head, &c.
Mr. Day, Yarmouth, fractured ribs.
Mr. Sparkes, Yarmouth, injured leg and chest.
Mr. Gilman, Norwich, injured head, face, &c.
Mr. Stanley, Norwich, bruised and shaken.
Henry Fuller, Norwich, back and head injured.
Dr. Eade, Norwich, injured in face and legs.
Dr. Smith, Norwich, cut on hands and face.
Mr. Cocks, Norwich, severely shaken.
Mrs. Cocks, Norwich, severely shaken.
Mr. [illegible], Norwich, injured legs and shaken.
[illegible]

* Two more died, Mrs. Coote and John Bear, since [illegible], making 27 deaths.

APPENDIX H.

GREAT EASTERN RAILWAY.

RETURN of ARRIVAL TIME of DOWN EXPRESS TRAIN and UP MAIL TRAIN at NORWICH THORPE STATION, for year ending 31st August 1874.

5.0 p.m. from London due at Norwich at 9.0 p.m.
8.40 p.m. from Yarmouth due at Norwich at 9.40 p.m.

September 1873.			October 1873.			November 1873.			December 1873.			January 1874.			February 1874.			March 1874.			April 1874.			May 1874.			June 1874.			July 1874.			August 1874.		
	Express	Mail.		Express.	Mail.		Express.	Mail.		Express.	Mail.		Express.	Mail.		Express.	Mail.		Express.	Mail.		Express.	Mail.		Express.	Mail.		Express.	Mail.		Express.	Mail.		Express.	Mail.
Date.	Minutes late.	Minutes late.	Date.	Minutes late.	Minutes late.	Date.	Minutes late.	Minutes late.	Date.	Minutes late.	Minutes late.	Date.	Minutes late.	Minutes late.	Date.	Minutes late.	Minutes late.	Date.	Minutes late.	Minutes late.	Date.	Minutes late.	Minutes late.	Date.	Minutes late.	Minutes late.	Date.	Minutes late.	Minutes late.	Date.	Minutes late.	Minutes late.	Date.	Minutes late.	Minutes late.
1	16	15	1	6	10	1	25	25	1	20	15	1	11	10	2	19	15	2	10	8	1	5	6	1	3	5	1	4	8	1	3	8	1	65	8
2	13	27	2	17	15	3	21	27	2	12	12	2	17	13	3	7	5	3	9	6	2	62	34	2	2	5	2	7	5	2	6	13	3	10	25
3	5	14	3	13	15	4	20	22	3	8	14	3	17	19	4	3	5	4	10	9	3	—	32	4	12	7	3	3	5	3	10	18	4	13	57
4	8	12	4	32	10	5	20	18	4	11	10	5	13	10	5	21	17	5	9	7	4	17	24	5	18	14	4	5	5	4	17	19	5	3	10
5	30	9	6	29	40	6	30	12	5	12	20	6	19	20	6	30	3	6	12	8	6	7	23	6	3	13	5	10	6	6	35	12	6	4	6
6	24	4	7	58	13	7	16	19	6	12	14	7	6	6	7	18	17	7	22	17	7	6	8	7	3	4	6	21	22	7	12	10	7	12	17
8	12	25	8	17	22	8	28	8	8	16	10	8	10	7	9	11	10	9	6	2	8	8	6	8	12	9	8	4	6	8	14	10	8	25	8
9	15	15	9	28	39	10	15	23	9	47	2	9	5	4	10	11	8	10	15	10	9	16	14	9	15	13	9	4	4	9	25	5	10	13	24
10	7	9	10	29	12	11	19	19	10	55	5	10	13	9	11	8	5	11	6	4	10	10	10	11	6	2	10	10	13	10	24	14	11	8	18
11	19	16	11	25	28	12	13	11	11	40	12	12	22	16	12	5	—	13	3	2	11	10	16	12	—	1	11	20	20	11	53	2	12	15	15
12	22	22	13	27	10	13	18	16	12	27	35	13	10	5	13	5	5	13	7	6	13	5	8	13	4	4	12	21	28	13	19	24	13	13	17
13	48	10	14	19	17	14	24	9	13	32	20	14	3	2	14	24	22	14	8	7	14	13	12	14	—	5	13	11	15	14	34	10	14	6	9
15	32	8	15	19	21	15	36	17	15	22	20	15	12	9	16	8	1	16	3	3	15	5	5	15	6	5	15	11	11	15	32	8	15	27	10
16	17	15	16	17	18	17	16	16	16	13	14	16	7	5	17	3	1	17	4	5	16	4	6	16	2	4	16	16	22	16	15	20	17	17	23
17	15	17	17	11	13	18	15	14	17	12	12	17	4	4	18	17	12	18	6	3	17	16	12	18	3	4	17	7	11	17	20	30	18	16	16
18	9	8	18	23	16	19	12	11	18	20	16	19	5	3	19	13	7	19	5	7	18	19	20	19	3	2	18	6	12	18	29	9	19	10	19
19	13	17	20	28	13	20	11	14	19	20	19	20	5	3	20	8	5	20	6	5	20	14	13	20	5	—	19	8	10	20	19	33	20	10	14
20	30	5	21	43	11	21	11	10	20	23	27	21	Nil.	1	21	4	1	21	4	7	21	2	—	21	13	9	20	16	11	21	18	15	21	8	10
22	24	5	22	24	10	22	24	8	22	31	9	22	27	—	23	6	2	23	2	4	22	7	5	22	38	1	22	8	7	22	9	15	22	6	10
23	16	17	23	23	13	24	22	18	23	43	10	23	11	7	24	4	2	24	5	5	23	11	7	23	40	1	23	5	7	23	5	3	24	14	19
24	4	7	24	20	25	25	20	6	24	26	13	24	5	3	25	12	10	25	7	6	24	—	2	25	15	33	24	4	5	24	6	10	25	13	13
25	16	21	25	18	20	26	8	7	26	16	17	26	15	11	26	15	13	26	2	5	25	6	7	26	5	35	25	2	5	25	16	37	26	10	17
26	18	17	27	14	18	27	12	8	27	30	5	27	4	3	27	6	3	27	5	5	27	8	6	27	—	4	26	9	10	27	21	25	27	4	10
27	17	25	28	25	27	28	5	5	29	14	15	28	9	7	28	2	3	28	5	10	28	10	7	28	2	10	27	5	5	28	10	10	28	14	16
29	26	5	29	15	15	29	20	20	30	17	13	29	9	10				30	9	5	29	4	2	29	7	8	29	8	9	29	15	19	29	17	70
30	31	9	30	33	37				31	15	12	30	4	5				31	6	3	30	3	1	30	8	4	30	—	9	30	11	13	31	46	17
			31	25	29							31	20	15																31	17	9			

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE,
DATED THE 26TH DECEMBER 1874,

INTO THE CIRCUMSTANCES ATTENDING THE ACCIDENT ON THE

GREAT WESTERN RAILWAY

WHICH OCCURRED NEAR

SHIPTON-ON-CHERWELL

On the 24th December 1874.

Presented to both Houses of Parliament by Command of Her Majesty.
April 1875.

LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

1875.

[C.—1197.] *Price* 3*s*. 6*d*.

[illegible]

2nd.—that [illegible] large numbers of wheels having the tyres fastened to the wheels by rivets [illegible].

3rd.—that they had become aware of defects in Gibson's process, which showed that with the wheel, as then constructed, it could not be altogether depended on, and that at that time they were not satisfied with the security afforded by Mansell's tyre fastenings for wooden wheels; and they now allege that there were faults of construction in Mansell's renewed patent of 1862.

In this latter contention they are supported by Mr. Mansell himself, who stated that there had not then (1865) been sufficient trial of his wooden wheels under the patent of 1862 to justify the company in ordering them.

It does not however appear, whether or not Mr. Mansell was of the same opinion, when the London and North-Western Railway Company decided in 1861, (four years previous to this tyre being ordered) to begin largely to make use of these wooden wheels, and had taken no less than 3,600 wheels up to the end of 1865.

It may further be remarked, that it is not known, [illegible] instance whatever has been recorded, of [illegible] fastened on a wheel by means of Mansell's [illegible] fractured, left the wheel; [illegible] defects in the want of [illegible] out, and [illegible] tyre has [illegible] continuous [illegible] objections [illegible] instance has been [illegible] led to an accident: [illegible] breaking off [illegible] a longitudinal [illegible] the breadth [illegible] drop off the [illegible] crossings.

[illegible] Railway Company [illegible] wooden wheels, in [illegible] having taken place [illegible] wheels with tyres [illegible] process. The number of [illegible] London and North-Western [illegible] being no less than [illegible] given in the Ap- [illegible]

[illegible] Great Western [illegible] the central [illegible] went to the boss, [illegible] having occurred on [illegible] November 1871, [illegible]* and a number [illegible] to their knowledge [illegible] given way at the [illegible]

[illegible] have had nothing [illegible] was arrived at in 1865, [illegible] use of rivets for [illegible] the placing of [illegible] and then fastening [illegible] rivets. It might [illegible] Mansell's process 1866) in the [illegible]

[illegible] Great Western is in oppo- [illegible] London and North-Western Rail- [illegible] Mansell's wooden [illegible] period of time, where [illegible] knowledge of the [illegible] under either patent, [illegible] the boss, and no [illegible] deemed necessary to [illegible]. But the objection to the [illegible] however, apply to iron [illegible] fastened on by Mansell's [illegible] similar method having apparently [illegible] limited extent, on [illegible] Great Western Railway prior to 1861, called [illegible] Tyler's report, [illegible] that year before alluded to, [illegible] to be an infringement of Mansell's patent of 1848, renewed in 1862.

There can, however, be no doubt that the patent of 1862 effects a decided improvement as regards the form and mode of applying the continuous rings for securing the tyres [illegible] Mansell's patent of 1862.

But these defects, whether little or great, do not seem to be pertinent to the question, whether the Company acted properly in reverting again to the use of rivets in 1865, for rightly or wrongly, and rightly as the Company then thought, and as may now be assumed, they had selected and had begun to use Gibson's process for fastening tyres on iron wheels so early as 1855, and had (as already shown by an extract from a report to the Board of Trade, which was not contradicted,) made great progress in placing their rolling stock on what they considered an improved footing as regards the safety of the public in 1861, and had determined to give up the use of rivets.

* Something was known to be wrong with the train as it was leaving the station, and the station master endeavoured, when too late, to try and stop it. If a more careful examination of the train had taken place, the defect would probably have been then discovered.

" every three or four carriages in a passenger train, a " proportion which may be economically provided by " the use of continuous breaks. On steep inclines, and " with trains that travel at high speed, a larger pro- " portion of break power is required."

Not one of these recommendations was attended to in the making up and despatching of the 10 a.m. express train from Paddington, or in sending it forward from Reading or Oxford on the 24th December, and the representations from the Board of Trade here referred to were entirely disregarded.

The state of the law on the subject, does not seem to require, that any of the usual precautions which are generally adopted by Railway Companies in conducting passenger traffic, need be followed, except such as are prescribed by the Regulation of Railways Act, 1868.

Any railway company may apparently do, just what it thinks proper, in conducting its own traffic. Thus at the present time, the Great Western Railway Company, have no regulations or instructions, which prescribe the manner in which their passenger trains are to be made up, or what amount of break power, in proportion to the number of the carriages and the nature of the gradients, is to be attached to them; nor in what manner the break power is to be distributed throughout the train, or if it is all to be placed at the front of the train, in accordance with the evidence given by one of the witnesses (Mr. Wilson) called by the company.

Again the company does not issue any instructions for the guidance of their superintendents and station masters, as to the load which should be taken on by the engines that run over the different sections of their line, or prescribe when, if at all, a second engine should be added.

All appears to be left to the superintendents and station masters, and to be dependent entirely on practice or the pressure of the traffic, so that a passenger train may be sent out from Paddington, as was stated by engine-driver Richardson to have been done from Oxford, with 12 or 14 vehicles behind the last break van with a guard riding in it, if the station master or platform superintendent acting for him thought it expedient, without incurring any responsibility whatever as far as the public who are to travel in it are concerned. Neither is there any rule or instruction to tell an engine driver what he should do when a vehicle in his train gets off the rails. *See* Appendix 15.

This absence of rules and regulations, on such essential points, is a most unsatisfactory state of things for the travelling public, who are told by the officers and servants of the company, and by sundry other skilled witnesses, when an accident of this frightful character has taken place, that it was altogether unavoidable, and that no alteration in the making up of the train, or the providing a larger amount of break power, and its proper distribution throughout the train, with a greater number of guards, could have prevented it or mitigated its results.

On Tyre Fastenings.

The Inspecting Officers have from time to time been called upon to report upon accidents caused by the fracture or flying-off of tyres from the wheels of railway rolling stock; from the commencement of the year 1847 to the end of 1874 in 80 cases, of which an abstract is given in Appendix 4.

From 1847 to 1857 they inquired into 26 accidents of this class, and simply reported upon the circumstances attending the accidents and the nature of the fractures, defective welds, or the quality of the material &c., &c. in the tyres. Of these 26 accidents, caused by the fracture of tyres, in 15 instances the tyres were fastened on to the rims of the wheels by bolts or rivets; one was fastened by a patent process that dispensed with bolts, and in 10 cases the mode of tening is not stated.

e 1857 there have been no less than 54 acci- " this kind, and the reports have been of a different character. In 41 cases the tyres were fastened on by rivets or bolts; in 3 the mode of fastening is not stated; and in 10 instances by patent processes,—one according to Cabry's, three according to Gibson's, and six according to Beattie's method.

In the year 1858 when reporting upon an accident of this kind which had occurred on the 29th June, near Carlton station, on the Great Northern Railway, by the fracture and flying off of a portion of the tire of the left leading wheel of the engine, which was fastened on by rivets, I first drew attention to the late Mr. Beattie's patented process for securing tyres on wheels, and stated that I had been informed that the Great Northern Railway Company had determined to relinquish the rivetted method of fastening tyres for all carriage wheels and the leading wheels of engines, by which it was hoped that, in the event of tyres breaking, the effect would not be to throw trains off the line; and Capt. Galton in his report for the year alluded to the success which had attended Mr. Beattie's process.

In 1859 and 1860 Capt. Tyler and I, in several reports, called attention to the necessity which existed for adopting some other mode of fastening tyres on railway wheels rather than by rivets or bolts, and on the 28th January 1861 I reported on an accident on the Shrewsbury and Hereford Railway (by which two persons lost their lives and four others were injured), precisely similar in character to that at Shipton on the 24th December last, inasmuch as the right leading wheel of a carriage next the tender lost its tyre and the trailing wheels had the axle broken. In that report are the following observations:—

" It is certainly unquestionable, and proved by the " experience of many years, that the tyres of wheels " on locomotive engines, carriages, and waggons are " particularly liable to break during severe frost; " and the cold of the present winter has caused a " very large number of these fractures, and the ac- " cumulation of a large quantity of broken and " disabled carriages and waggons at many of the " principal stations. Experience has also established " the fact that these fractures almost invariably take " place either at the holes through which the tyres " are bolted or rivetted on to the inner rim of the " wheel, at the weld where that is in any way " defective, or at some part of the tyre where there " may have been some flaw or defective metallic " adhesion. The rivet holes usually diminish the " sectional area of the tyre $\frac{1}{5}$ or $\frac{1}{6}$, and thus the parts " where they are made generally form the weakest " part of the tyre. The fracture of a tyre is of itself " of comparatively little importance provided it can " be retained in its place on the wheel till the journey " be completed; but when the tyre breaks the strain " is almost always so great as to cause the four or " five $\frac{3}{4}$ inch or $\frac{7}{8}$ inch bolts or rivets to break " immediately, when the tyre is solely secured to the " inner rim by bolts or rivets, and then the tyre flies " off, the wheel breaks to pieces, and in many cases " the carriages are thrown off the line, and an accident " more or less serious in its consequences ensues. " Now this result is totally unnecessary and may be " easily avoided.

And again,—" After the repeated accidents which " have occurred year after year, fully proving the " insecurity and the danger to the public which is " involved by continuing to adopt the old mode of " fixing on the tyres by bolts or rivets, they should " be held completely responsible for continuing to use " so objectionable and dangerous a process, when there " are many ways in which the tyres can be fixed on " to wheels where they will not fly off even if they " do fracture."

On the 7th February of the same year Capt. Tyler, when reporting on an accident which had taken place on the London, Chatham, and Dover Railway, near Teynham, entered into a good deal of most valuable detail, and accompanied his report with drawings and descriptions of the various modes of fastening tyres on wheels which had then been introduced, other than by

The Great Western Railway Company have been asked for a statement showing the number of wheels secured by rivets or bolts, or by tyre fastenings of any other kind, which were in use in 1861 in conducting their passenger traffic, but they are unable to supply it. See Appendix 17.

If, in 1865, they had continued to make use of Gibson's process, in the belief that it was the best process then known, or even as good as any other, nothing, probably, could have been said if, on the 24th December last, this right wheel of No. 845 third-class carriage, had had a tyre fastened on it by Gibson's process, and it is quite possible that it would then have remained on the wheel. It might fairly have been urged that they had done all in their power, and according to the best advice obtainable at the time, to fasten the tyre on to the wheel by the process which they then considered was most likely to keep it on the wheel in the event of its fracturing.

It is right to state, that it appears that subsequent to the year 1868, the Great Western Railway Company have been proceeding with energy, and more particularly so since the year 1871, in introducing the Mansell wooden wheels under their passenger carriages, so that they had, at the end of 1874, no less than 6,330 pairs of Mansell's wooden wheels, while there were only 181 pairs of iron wheels which still had the tyres fastened by rivets, and 108 pairs of wheels besides, which the Company's Officers had not yet been enabled to ascertain in what manner the tyres were fastened. This information is contained in two returns put in by the railway company, and which are given in the Appendix No. 9.

But the Court was not put in possession of any information to show what the Great Western Railway Company had been doing in this respect between the winter of 1860–61, when the necessity for prompt action was made so very apparent by the number of tyre accidents which then occurred during the severe weather, and the year 1866, when they first began to try the Mansell wooden wheels as an experiment.

The evidence of Messrs. Jeffery, Hurst, McConnell and Wilson, brought forward by the railway company, apparently had for its main object to prove, firstly, that what the Inspecting Officers have called in some of their reports the vicious process of fastening tyres on carriage wheels by rivets, through the tyre and rim of the wheel, was superior to any other known process. If those witnesses opinions are correct in this respect, it would show that the Great Western Railway Company were wrong in what they did first in 1855, continued in 1861, upheld in 1873, and still continue at the present time; and, secondly, that the Inspecting Officers have made mistakes in suggesting forms of tyre fastenings, and in recommending some of the systems which were known and in use in the year 1861. An examination of the reports of the Inspecting Officers on this class of accident, of which an abstract is given in the Appendix 4, will show that they have never hesitated to state fairly the cause of the accidents, and whether due to a patented or other process of fastening tyres on wheels, or to their being secured by rivets or bolts; and the evidence of the above-named gentlemen may be contrasted with that of Messrs. Armstrong and Dean, the locomotive and assistant locomotive superintendents of the Great Western Railway Company, and to the fact that the rivetted mode of fastening had for such wheels been given up by the company, and is no longer used in 1875.

One of the witnesses, Mr. McConnell, who advocated the fastening by rivets, stated that they were useful for holding on loose tyres, but not for retaining on broken ones, although he had known many cases in which they had been so retained. But the fact is that rivets do not always hold on unbroken tyres that become worn and loose, as the returns to the Board of Trade continually show.

In July 1873 the Great Western Railway Company, in answer to a circular letter from the Board of Trade, dated 3rd July 1873, addressed to 13 of the principal Railway Companies in the kingdom, replied that they had adopted Mansell's wooden wheels for carriages, and still continued to use Gibson's process for iron wheels; and the information received from the other 12 railway companies, which had been applied to at the same time, and from the Midland Railway Company, completely upheld the opinions expressed by the Inspecting Officers 12 years before, that rivets and bolts should not be used as a means of fastening tyres on carriage-wheels: and a similar remark would apply as far as engine and tender-wheels are concerned, with the exception of the answers from the London and North-Western, Manchester, Sheffield, and Lincolnshire, and South-Eastern Railway Companies, which still adhere to the old process of using rivets or set screws for these wheels.

Under the provisions of the Regulation of Railways Act, 1871, sec. 6, and an order made by the President of the Board of Trade, dated the 1st November 1871, returns are required to be made to the Board of Trade by all Railway Companies of certain classes of accidents which have occurred on their lines.

Of 37 cases of tyre accidents reported by all the Railway Companies, except the Great Western, during the year 1872, 26 were said to have been fastened on by bolts, rivets, or set screws, and of these five tyres remained on the wheel when the rivets fractured, 12 quitted the wheel, and no particulars are given respecting 9. Again, of the 37 cases; in 16 instances the tyres left the wheels, 13 of this number were fastened by rivets or bolts, two by a patent process (one of Beattie's and one of Gibson's), and one tyre came off with the tyre unbroken, having been fastened by bolts.

In	6	instances the tyres remained on.	
	9	„ no particlars were given.	
	1	„ tyre became loose.	
	2	„ rivetted	Not stated whether the tyres remained on or quitted the wheel.
	2	„ broke at bolt or screw hole	
	1	„ broke into four pieces	
	16	„ tyre left the wheel.	
Total	37		

In 1872 the Great Western Railway Company reported 22 tyre accidents, of which three were simply split tyres, and the remainder transverse fractures, and in no instance did the tyres which were fastened on by Gibson's process leave the wheels.

In 1873 the other Railway Companies reported 25 tyre accidents.

The tyres flew off in	-	14 instances.
„ remained on	-	6 „
„ no particulars given		5 „
		25

Of the 25 instances, 18 were fastened by rivets or bolts or set screws.
„ 2 by a patent process.
„ 5 no particulars given.

The Great Western Railway Company returned five tyre accidents. Gibson's fastening was used in each instance, and in two cases where the tyres were fractured, the tyre came off the wheel in one instance, in the other it did not; and in the three remaining cases the tyre was either split or bulged, and did not come off the wheel.

In 1874 the other Railway Companies reported 48 tyre accidents.

The tyres flew off in	-	16 instances.
„ remained on	-	19 „
„ no particulars given		13 „
		48

A patent process appears to have been used only in one instance; the tyre remained on.

…nsider that they are wanted …
… break for eight vehicles …
… tender, is sufficient …
… that proportion of break …
… train; and who agree …
… of the Great Western …
… not signify either …
… a vehicle in a train …
… second break-van with …
… of 15 vehicles …
… with six vehicles …

… a retrograde policy …
… Railway Company …
… 56 of the company …
… January 1863, it …

… started from a station …
… ks, lamps, and grease …
… according to circumstances …
… superintendent …
… gradients a second …
… break must be …
… of special trains …
… carriages and when …
… than 12 carriages …
… them; and when …
… ks. The senior guard …
… last carriage, and …
… ated equally through …
… to select carriages …
… and efficient breaks."

… company's book of …
… now in use. It is …
… especially intended …
… supposed to travel …
… narrow gauge …
… broad gauge …
… doubt that …
… must travel …
… portions of …
… average speed …

… of a break …
… train it is …
… at the rear …
… the couplings …
… between carriages …
… the …
… the …
… train.

… Western Railway Company …
… make use of a modification of …
… and no less than 10 up and 10 down of …
… trains out of and into London, including …
… and the Scotch express, and the Limited …
… is applied to sections of carriages, not more …
… seven carriages and a break-van being coupled …
… coupled together, and in some instances two …
… continuous breaks form part of the same …
… they …
… structi…

In this l… carriage superintendent of the … Railway (Mr. Bore) was … a modification of Clark's con… only on the main line during … that continuous breaks were … to increase the number of acci… of heavy passenger trains … that their experience … Railway was … continuous break … company … continuous … fitted to … com…
Mr. Mansell … then (1865) … under the pate… ordering them.
It does not … Mr. Mansell was … London and North… cided in 1861, (four … ordered) to begin … wooden wheels, and … wheels up to the end of …
It may further be rema… that any instance whatev…

… proceeding is justified by the Officers of the company, who maintain that it does not in any way compromise the safety of the public. This opinion of the officers and servants of the company is in opposition to experience; and thus, if anything does happen to go wrong, as in … unfortunate accident, there seems to be no differen… ing such opinions, and in attempting to p… case, that everyth… connected with … train was abso… right, except, … ness, Mr … appeared to … company … glaring … go, go …

There does not seem to have been much occasion for the pilot engine at Oxford. The train had lost time, it is true, but it was mostly lost at the stations, at Reading and Oxford. The Inspecting Officers, the late Sir F. Smith and Sir C. Pasley, at a very early period, expressed opinions against placing two engines in front of a passenger train, and I have more recently expressed the same opinion.

Communication between Passengers and the Servants of the Company in Charge of the Train.

The Regulation of Railways Act, 1868, section 22, enacts that every railway company shall "provide and "maintain in good working order, in every train "worked by it which carries passengers and travels "more than 20 miles without stopping, such efficient "means of communication between the passengers "and the servants of the company in charge of the "train as the Board of Trade may approve, under a "penalty of 10*l.* for each case of default."

Subsequent to the aforesaid enactment, the Board of Trade, on the 27th February 1869, in a letter addressed to Mr. Allport, as chairman of the general managers of most of the principal railways, approved of the cord system of communication known as Harrison's system, fixing no period for the continuance of their approval, and reserving to themselves the right of reconsidering the question in the event of the system proving defective when tried upon an extensive scale.

In a letter of the 15th July 1872 to Mr. Allport, the Board of Trade intimated that on account of the numerous complaints of the inefficiency of the system, and in some cases of its total failure, their approval of it would, within three months, be formally withdrawn, and requested that some other means should be submitted by the companies for approval; but, on representations from Mr. Allport, the time for the withdrawal of the Board's sanction of Harrison's cord system of communication was extended from time to time to the 1st August 1873. The withdrawal was notified by the Board of Trade by letter to Mr. Allport, dated 30th July 1873, stating that they "hereby revoke and withdraw, on and after the "1st August 1873, their approval, under section 22 "of the Regulation of Railways Act, 1868," which approval had been given in a letter dated the 27th February 1869; a copy of this letter was by a circular letter of the 31st July sent to 123 railway companies, and its receipt by the Great Western Railway Company was acknowledged.

No other system of communication has been since submitted by the railway companies in lieu of Harrison's system, and hence the cord communication on the 10 a.m. express train, which failed to be an efficient means of communication between the passengers and the servants of the company when Mr. Lewis and others endeavoured to make use of it on the 24th December, was not one which was at that time authorised to be used by the Board of Trade under the Act of Parliament already mentioned requiring it to be provided. The fact of a broken pully being picked up, as stated by the General Manager, Mr. Grierson, does not in my opinion prove that the failure of the cord as a means of communication, was due to its having been broken. The cord was not broken from the front carriage to the engine, as the engine driver, Richardson, saw the cord shake; neither was it broken before reaching the head guard, Price's, van, otherwise the wheel in that van would not have been whirled round.

The General Manager of the company, Mr. Grierson, complained that the Board of Trade would not [illegible] the kind of apparatus that should be made use [illegible] effecting the means of communication between [illegible]engers and the servants of the company in [illegible] the train, but the short answer to this [illegible]hat the Act of Parliament was specially [illegible] view to this course not being followed. [illegible]vler and I had long since expressed [illegible]rior to the introduction of Har- [illegible] that electricity afforded the most likely means for providing an instantaneous means of communication between the passengers and the several guards and the driver of the engine, and also the means of inter-communication between the driver and guards, and had poidted out the manner in which its efficiency might be ascertained and maintained, by causing all trains to be started from all stations by the electric signal alone. Electricity has been tried on two lines of railway in England, and is represented as having been fairly successful; it is still used on the Royal Train provided by the London and North-Western Railway Company, and it has been sanctioned by the Board of Trade for the South-Eastern Railway.

But the General Managers above referred to, who applied to the Board of Trade, did not think any means of communication was at all required, or likely to be useful or successful.

In the Appendix 3 the instructions are given for the use of the cord communication on the Great Western Railway.

The evidence of Messrs. Grierson and Tyrrell, the General Manager and Superintendent of the Great Western Railway, is so important, as showing the views entertained by the company, that it has been deemed desirable to print it at length, and it is given in Appendices 1 and 2.

Conclusions.

I have made very careful examination of the line between Woodstock Road station and the scene of the accident, and have noted the marks on the permanent way and the position in which the pieces of the tyre were found, and I have compared the evidence which was furnished by the marks on the permanent way with that given by the servants of the company who were in charge of the train, and of the passengers who endeavoured to make use of the cord communication.

It is impossible to state where the first fracture in the tyre took place. It may have been near Woodstock Road station, and the evidence of the witness Garner points in that direction, but there were no indications on the permanent way to prove any such supposition, and I think it is not very likely; but the second fracture certainly occurred just before reaching the spot at which the short piece of tyre, which had one rivet hole through it, was found 467 yards south of the river bridge; and the two blows or bumps which the witnesses Lewis and Ridd heard under the front part of the third-class carriage No. 845, in which they were riding, were most probably made when the short piece of the tyre flew off the right wheel, and was thrown up against the under side of the floor of the carriage, and when it was again thrown up when run over by some wheel in the train, and this closely accords with Proctor's evidence, who describes the shaking to have commenced after passing the 69½ mile post.

Assuming that the train was at that time actually travelling at the rate of 40 miles an hour, it would have occupied about 23 seconds to run the distance to the river bridge, and if Lewis, Garner, Procter, or Ridd had then been in possession of an efficient and instantaneous means of communication, with the head guard of the train and the engine-driver, the breaks might then all have been applied together; but I am not prepared to say that, taking into account the small and insufficient amount of break power and the position of the guards break-vans in this train, there would not then have been a serious accident, because it is quite impossible to resist the conclusion that, although the fracture of the tyre was undoubtedly the original cause of the accident, its most disastrous results were the immediate consequence of the grievous mistake made, with the best intentions, by the drivers and firemen, in at once reversing their engines and applying their tender breaks, without knowing what was actually amiss in the train.

The under guard, Hill, became aware that something was wrong as soon as Messrs. Lewis, Garner, Ridd, and Procter, and he at once put on his break. At that time, the train was running on an easy curve

APPENDIX.

APPENDIX No. 1.

The evidence of Mr Grierson, the General Manager of the Great Western Railway, is as follows:—

The cord communication at present in use on the Great Western Railway was sanctioned by the Board of Trade, but that sanction was withdrawn on July 14, 1874. No means of communication have been submitted for the sanction of the Board of Trade since that time. The cord communication was submitted to the Board of Trade by the railway companies after having considered upwards of 160 methods for giving communication between the driver and passengers and guard. Before submitting the cord as being the most simple and effective means of carrying out the requirements of the legislature on the subject, the officers of the railway companies frequently expressed a very strong opinion that there were no known means by which an absolutely reliable communication could be made for the purpose. They over and over again also expressed an opinion that the adoption of any system would, as far as they could judge, not be likely to lead to the prevention of accidents, to the extent or in the way in which the subject was theoretically discussed and urged upon them. I was one of the committee of managers who dealt with the whole question, and they were unanimous in believing, and I am of the same opinion still, that, however desirable that there should be a good communication between the passengers and the men in charge of the trains, that it would be found that the loss of time, however short, in working that communication would be too great, taking into consideration the speed at which trains run and the distance they must travel before they can be pulled up to actually prevent accidents taking place.

No suggestion was made by the Board of Trade or any of its officers to the railway companies, as far as I can remember, recommending the adoption of any different system. The result of the recommendation which was made early in 1869, was that the Board of Trade did approve of the cord communication to be used on all the railways north of the Thames. I refer here to what has been known as Mr. Harrison's cord communication. Upon two railways south of the Thames cord communications were also approved of by the Board of Trade, one being outside the carriages and one inside.

And though the Board of Trade have thought it proper and desirable to withdraw their approval with respect to Harrison's cord communication, they have not withdrawn their approval to the other two means I refer to.

Prior to the committee of railway managers coming to the conclusion that the cord communication was in their judgment the simplest and most reliable means that could be adopted, experiments were also made for effecting the communication by electric telegraph, but these experiments failed.

The subject of a communication by electric telegraph has been frequently considered and discussed, but the majority of railway managers have always been of opinion that it would be most unreliable, and as an instance I may state that when an electric telegraph engineer read a paper and explained his proposed system before the Institution of Civil Engineers at a meeting at which I was present it then failed, when he stated in explanation that a little dust had got in.

In my opinion, then as now, if a little dust in a room was sufficient to disarrange the apparatus, it could not possibly be reliable in actual working upon railways especially in summer weather; unless some improvement which I am not aware of is discovered.

I may state that since the railway companies received notice from the Board of Trade of the withdrawal of their approval from the cord communicat that interviews took place between a committee railway managers and the late president and som the officers of the Board of Trade. At those meeti it was pointed out to Lord Carlingford, then Chichester Fortescue, that if the Board of Trade k of any better means of communication which induced them to withdraw their approval f Harrison's cord, that the railway companies w most desirous to know what it was, but that in mation was never afforded to them.

If therefore the Board of Trade or their offi were and are acquainted with a more reliable syst it is not the fault of the railway companies that it not been adopted, as notwithstanding their repe applications, they have never been told what it is.

The first committee acted upon behalf of all rail companies, and was appointed by the Clearing Ho but the South-Eastern Company preferred telegraph communication. They still maintain communication. I have seen statements showing it has been efficient, but the circumstances of South-Eastern and those of other companies are rule altogether different. And the South-Wes Company adopted the electrical communication some of their trains from London to Exeter and since abandoned it.

If the Board of Trade consider that the elec communication is the one that ought to be substit for the cord communication, they have never municated that information to the railway compan

The Act of 1868 requires the railway companie provide an efficient communication, subject to approval of the Board of Trade. But before the passed, the railway companies urged that inasmu they were not aware of any communication would be absolutely efficient, it should be one w the Board of Trade should lay down, but the B of Trade distinctly refused to take the responsib of prescribing what the communication should be

I have seen individual opinions expressed by offi of the Board of Trade in their reports in favour o telegraph communication; but if the officers unanimous upon the subject, the authorities of Board of Trade either do not agree with their off or at all events they have not so informed the rai companies.

Neither the Great Western Railway Company any other company, so far as I am aware of, have slightest objection to adopt any system which ca shown to be reliable.

With respect to the evidence which has been g that the cord communication did not act when p by passengers as soon as they felt there was somet wrong with Carriage 845, I may state that walking over the river bridge with Colonel Yolla picked up one of the pulleys through which the communication passes, which clearly showed either the tyre in flying, or by some other means pulley had been knocked off, or, as stated by witness Garner, the passengers in pulling in diff directions may have pulled a pulley off, which acc for the cord not acting.

I fear the electric communication is not reliabl

The London and North-Western Company the electrical communication on the Royal train.

In passing over a portion of our line, another

2. That this clip should have square notches and not slanting dovetails ;
3. That these clips must be continuous on both sides, and not intermittent with spaces between them ; and
4. That the strength of the clips and of the portions of the tyres clipped should be in proportion to the strains that are liable to be brought to bear upon them, having regard to the material and strength of the tyres.

These points are all secured by the Mansell system, but it is quite possible, by altering the form of the tyre and the construction of the wheel, that the same security may be otherwise obtained.

Recommendation.

The inquiry into this accident, reveals the very important fact, that there are still a large number of wheels under vehicles running in passenger trains, where the tyres are still only secured, to the rims of the wheels by rivets or bolts, although some Railway Companies commenced at least 20 years since, to adopt some more secure and more safe mode of fastening.

The life of the skeleton of an iron wheel may be extended over a great number of years, and the question arises how long will a railway company be justified in continuing to put new tyres on to these skeletons as the old ones wear out, only securing them by means of rivets or bolts ; and, at the same time, denying when an accident occurs, through the fracture and flying off of such tyres, that they are legally liable to pay compensation to the passengers injured in such accident.

Many railway companies are said to have a large number of wheels under passenger carriages with the tyres fastened only by rivets. Some, on the other hand, have not a rivetted tyre among their rolling stock. The London and South-Western Railway Company is in this position.

I think, therefore, it would be highly desirable to obtain a return, through the intervention of Parliament, of the state of the rolling stock of all railway companies, showing the number of vehicles, and the number of wheels under them, which run in passenger trains, that have the tyres fastened by bolts or rivets, or by any other species of tyre fastening, specifying the same ; to enable a correct opinion to be formed of the magnitude of the risk to which the travelling public are still subjected, from the defective and unsafe method of fastening tyres on wheels, which caused this deplorable accident.

I have, &c.,
W. YOLLAND,
Colonel.

I entirely concur in the opinions expressed in the above report.

W. W. RAVENHILL,
Barrister-at-Law.

The Secretary,
(*Railway Department*),
Board of Trade.

APPENDIX.

APPENDIX No. 1.

The evidence of Mr. Grierson, the General Manager of the Great Western Railway, is as follows:—

The cord communication at present in use on the Great Western Railway was sanctioned by the Board of Trade, but their sanction was withdrawn on July 1st, 1873. No means of communication have been submitted for the sanction of the Board of Trade since that time. The cord communication was submitted to the Board of Trade by the railway companies after having considered upwards of 160 methods for forming communication between the driver and passengers and guard. Before submitting the cord as being the most simple and effective means of carrying out the requirements of the legislature on the subject, the officers of the railway companies frequently expressed a very strong opinion that there were no known means by which an absolutely reliable communication could be made for the purpose. They over and over again also expressed an opinion that the adoption of any system would, as far as they could judge, not be likely to lead to the prevention of accidents, to the extent or in the way in which the subject was theoretically discussed and urged upon them. I was one of the committee of managers who dealt with the whole question, and they were unanimous in believing, and I am of the same opinion still, that, however desirable that there should be a good communication between the passengers and the men in charge of the trains, that it would be found that the loss of time, however short, in working that communication would be too great, taking into consideration the speed at which trains run and the distance they must travel before they can be pulled up to actually prevent accidents taking place.

No suggestion was made by the Board of Trade or any of its officers to the railway companies, as far as I can remember, recommending the adoption of any different system. The result of the recommendation which was made early in 1869, was that the Board of Trade did approve of the cord communication to be used on all the railways north of the Thames. I refer here to what has been known as Mr. Harrison's cord communication. Upon two railways south of the Thames cord communications were also approved of by the Board of Trade, one being outside the carriages and one inside.

And though the Board of Trade have thought it proper and desirable to withdraw their approval with respect to Harrison's cord communication, they have not withdrawn their approval to the other two means I refer to.

Prior to the committee of railway managers coming to the conclusion that the cord communication was in their judgment the simplest and most reliable means that could be adopted, experiments were also tried for effecting the communication by electric telegraph, but these experiments failed.

The subject of a communication by electric telegraph has been frequently considered and discussed, but the majority of railway managers have always been of opinion that it would be most unreliable, and as an instance I may state that when an electric telegraph engineer read a paper and explained his proposed system before the Institution of Civil Engineers at a meeting at which I was present it then failed, when he stated in explanation that a little dust had got in.

In my opinion, then as now, if a little dust in a room was sufficient to disarrange the apparatus, it could not possibly be reliable in actual working upon railways, especially in summer weather; unless some improvement which I am not aware of is discovered.

I may state that since the railway companies received notice from the Board of Trade of the withdrawal of their approval from the cord communication, that interviews took place between a committee of railway managers and the late president and some of the officers of the Board of Trade. At those meetings it was pointed out to Lord Carlingford, then Mr. Chichester Fortescue, that if the Board of Trade knew of any better means of communication which had induced them to withdraw their approval from Harrison's cord, that the railway companies were most desirous to know what it was, but that information was never afforded to them.

If therefore the Board of Trade or their officers were and are acquainted with a more reliable system, it is not the fault of the railway companies that it has not been adopted, as notwithstanding their repeated applications, they have never been told what it is.

The first committee acted upon behalf of all railway companies, and was appointed by the Clearing House, but the South-Eastern Company preferred the telegraph communication. They still maintain this communication. I have seen statements showing that it has been efficient, but the circumstances of the South-Eastern and those of other companies are as a rule altogether different. And the South-Western Company adopted the electrical communication on some of their trains from London to Exeter and have since abandoned it.

If the Board of Trade consider that the electric communication is the one that ought to be substituted for the cord communication, they have never communicated that information to the railway companies.

The Act of 1868 requires the railway companies to provide an efficient communication, subject to the approval of the Board of Trade. But before the Act passed, the railway companies urged that inasmuch as they were not aware of any communication that would be absolutely efficient, it should be one which the Board of Trade should lay down, but the Board of Trade distinctly refused to take the responsibility of prescribing what the communication should be.

I have seen individual opinions expressed by officers of the Board of Trade in their reports in favour of the telegraph communication; but if the officers were unanimous upon the subject, the authorities of the Board of Trade either do not agree with their officers or at all events they have not so informed the railway companies.

Neither the Great Western Railway Company nor any other company, so far as I am aware of, have the slightest objection to adopt any system which can be shown to be reliable.

With respect to the evidence which has been given that the cord communication did not act when pulled by passengers as soon as they felt there was something wrong with Carriage 845, I may state that when walking over the river bridge with Colonel Yolland I picked up one of the pulleys through which the cord communication passes, which clearly showed that either the tyre in flying, or by some other means, the pulley had been knocked off, or, as stated by the witness Garner, the passengers in pulling in different directions may have pulled a pulley off, which accounts for the cord not acting.

I fear the electric communication is not re[illegible]

The London and North-Western C[illegible] the electrical communication on the R[illegible]

In passing over a portion of our [illegible]

closely (if there was the slighest variation from them, and it is utterly impossible to foresee all the circumstances arising in the working of a railway,) the men would be placed either in the position of not being able to carry on their work at all, or, on the other hand, they might be subject to pains and penalties from the company for having made what might only be a slight infringement of the rules.

The rules are defined at present in spirit, but it would be very different if they were defined specifically by letter.

At present the responsibility rests on the divisional superintendents to provide for the safe working of the trains in whatever way it may be necessary.

The subject is not disposed of, but is still under consideration.

The rules as to brake power inserted in 1865 Rule Book was not adopted without the most careful consideration, and I believe it was twice discussed before the directors.

I am aware, with reference to the requirements of the Board of Trade on the opening of new lines, that they put in certain recommendations as to the working of trains, but I am not aware of any railway company having adopted their recommendation as to brake power; indeed, as far as I can ascertain, this train had as large an amount of brake power upon it as any railway company in England adopts.

This observation does not apply to the Lancashire and Yorkshire Company, who have continuous brakes, but I have never heard of any Board of Trade officer recommending that we should generally adopt Fay's system, although they have recommended more brake power, but not which was continuous brakes.

In my opinion any system of continuous brakes adopted at all should be universal, at all events to all companies who exchange stock.

APPENDIX No. 2.

Mr. Tyrrell's evidence is as follows :—

I am superintendent of the Great Western Railway. I have been upon the line 30 years; only 10 years in my present position.

Book of rules handed in is the one at present in use.

This 1865 book contains all the rules and regulations that exist at present. The 1863 book contains the regulations from 1863 to 1865.

In the book at present in use the only rule referring to the making up of trains is rule 57, which says that no train may be started from a station without proper and sufficient brakes, lamps, and guards. These must be apportioned according to circumstances and at the discretion of the station-master or officer on duty, and the guards must be distributed along the train so as to give the best effect to the brake-power. There is no printed rule as to what is sufficient brake-power. There is no rule stating where the vans with guards in them shall be placed in the train. There is no rule which prescribes how many guards shall be sent with a train. That is left by the rule to the discretion of the station-masters. The station-masters are under the superintendents of the line. There is no rule which prescribes that there shall be a guard riding at the tail of every passenger train. I consider that as the 11.40 p.m. train left Oxford on December 24th rule 57 was complied with as to the guards being so placed in the train as to give the best effect to the brake-power.

There was no controlling power on the last six vehicles, except from the front. I do not think there was any difference in the effect from where the van was placed to that if placed at the tail of the train.

I cannot call to my mind the exact reason for the alteration of rules in 1863. The rule No. 56 mentioned in 1863 rules applies more to excursion trains on the broad gauge railway over steep gradients. It states that a second-class carriage with an efficient brake must be placed at the rear of all excursion or special trains containing more than eight carriages, and when such trains shall consist of more than 12 carriages, three guards shall be sent with them, and when of more than 20 carriages, four guards. The senior guard must always ride in the last carriage, and the junior guards must be distributed equally throughout the train, care being taken to select carriages for them provided with proper and efficient brakes. The reason I have said this rule was applicable to the broad gauge is that the rule mentions a second-class carriage being fitted with an efficient brake. This is the custom on the broad gauge and not on the narrow gauge. In 1863 we had a small portion of narrow gauge lines, not much, but these rules were applicable to the narrow gauge lines as well as the broad gauge. From Birmingham to Chester was narrow gauge, and a few short branches out of it, a comparatively short portion of line (about 90 miles). I am not aware that the Board of Trade disapproved of the practice of drawing a train with more than one locomotive in either years 1841 or 1844.

I was not on the railway in 1841. In 1844 I was a station-master, and should not know much about it.

I do not know of the recommendation in 1842 as to placing an empty carriage next the tender.

The sound of the whistle is not to be depended on to give warning to the guard to apply his brake. It was not heard in this case by guard Price. I have known frequent instances where it has failed. I have heard that the sanction to the use of the cord communicator has been withdrawn by the Board of Trade, and that such withdrawal was intimated to all railway companies by means of a circular. I consider that in the Shipton case the drivers acted properly in doing what they did, at the same time not knowing what was disabled in the train.

I think if they had simply shut off steam and not reversed their engines the consequences might have been less disastrous. It is merely conjecture. There are so many things mixed up in the question.

I consider that carriage 845 began to leave the left rail before the engine drivers did what they did. As soon as the coupling between the tender and carriage was slackened, I think carriage 845 went out to the right.

There is in the 1865 regulations nothing as to when a station-master shall put another engine in front of the train and when not.

We began to work the narrow gauge line from Chester to Birmingham in 1852 or 1853. It is about 80 miles in length.

Since 1860 it has been the constant practice of all railways I am acquainted with to run their trains with two engines.

Subsequent to 1855 and up to the present time I am aware of no recommendation or statement of the Board of Trade condemning the practice.

All railway companies have not the two whistles on the engine which we have. I am not aware of any companies who have the separate guard's whistle. I am not aware whether the Lancashire and Yorkshire Company's engines have a guard's whistle or not. I do not think the Board of Trade have sanctioned any other systems of communication besides the cord and electrical. I know of no company except the South-

Eastern, and partially the South-Western, who use the electrical communication. I am acquainted with the experiments made by Mr. Spagnoletti, our electrical superintendent. They were made about two or three years ago. I have seen the other kinds of communication tried. I cannot say how many were tried on the Great Western Railway, but not many. I have never known an accident to occur from placing vehicles behind the last guard's van.

In my opinion the officials at Paddington who sent off the train with four vehicles behind the last guard's van did quite right under the circumstances.

In my judgment Gibbs did right in sending on the train from Oxford as it was made up. He should not have taken out and placed the van at the tail of the train. It would have caused immense delay. I think the fact that there were six vehicles behind the last guard's van did not affect the Shipton accident in any way whatever. I am acquainted with the practice of other companies with regard to brake power. I believe it is the practice of other companies generally to run one brake-van, with a guard in it, to about eight coaches. I have ascertained the practice of other companies on this point. There was a third brake-van on this train without a guard, and it has been the constant practice to put an extra guard in the train at Leamington or Warwick, if the station-master considers there is not sufficient brake power on the train. It is not an invariable practice with any company to place a brake-van at the tail of the train; they do if they can. In my judgment no amount of brake power would have prevented the consequences of the Shipton accident. The whole thing occurred in a few seconds.

In my opinion, so far as the safety of this particular carriage is concerned, the position of Hill's van was quite as good as if it had been placed in front of the carriage. It is the ordinary practice of all companies to attach a brake to the tail of a train.

This is an exception which is made on every railway every day. If companies are running 30 or 40 trains a day five or six might be sent away without a break-van at the tail of the train.

On our line it is not the usual practice to send out trains with six vehicles behind the last brake-van. This occasion was quite an exception, and it was owing to Christmas traffic that that number was put on behind the last van.

There are no written instructions that I am aware of given to engine-drivers as to their mode of action in case of accident. They have a book of instructions given to them. There is nothing bearing on this case in that book.

The placing of six vehicles behind the van was owing to the pressure of traffic.

The proper place for the head guard under ordinary circumstances is at the tail of the train, but not on account of safety. It is for convenience in working. I am not aware that the broken wheel came into collision with any foreign body near Woodstock Road, nor where the first piece of tyre was found, nor where the second piece of tyre was found.

It would take about ten seconds to run from the river bridge to the canal bridge. During this time there was not time to have stopped the train, nor whilst running the 700 yards.

I am aware of the existence of the minute published from a meeting of the officers of the Company. That minute has been carried out.

On the morning of 24th December there was a great number of passengers to go forward. Under ordinary circumstances a break-van would have been placed at the tail of the train. The extra guard has been put in at Leamington on account of having to ascend Hatton Bank.

On the broad gauge it is the practice to put five or six vehicles behind the last van. There would be as much strain on the draw bars as in a narrow gauge train. I have never known an accident to arise from the practice. I think there is no objection to it.

I think with the break power attached to that train if drivers and guards had notice they could not stop the train under half a mile or three-quarters of a mile. If there had been three guards instead of two they might stop in 100 yards short of this distance. The rails were very slippery. Since the adoption of the cord communication I do not know that there has been another method submitted to the Board of Trade for approval.

It has always been the practice to connect the cord with the last van only, not to the leading van. The guard in the leading van cannot be communicated with by the passengers.

I do not know whether an extra guard is always put in at Leamington or Warwick when the train consists of 15 vehicles; I do not think that our records will show. I do not think the head guard keeps a record. I think as a rule another guard would be put in at Leamington if the train consisted of 15 vehicles. The plan is carried out; it is done every week I should say.

(*Great Northern Company's time book with remarks as to brake power handed in.*)

The cord is fixed at the end carriage of the train, but carried from that end into the guard Price's van. If a guard had been put in at Leamington, the cord apparatus would have been altered.

It appears that the practice of the Great Northern Company with regard to brake power is similar to that of the Great Western Company.

On some parts of the Great Western line we put on more brake vans than on the main line.

The shifting of the break van to the rear at Oxford would have delayed the train 8 or 10 minutes. The shifting of the guard and luggage from the ninth vehicle to the tail of the train would have taken about the same time. Both would have entailed a delay of 16 minutes.

I do not think it would have made any difference to the ultimate position of carriage 618 if there had been a guard in the last van.

The rule of 1863 mentioned, could not have applied to narrow gauge traffic. There were no special rules for the 80 miles of narrow gauge line. There are some steep gradients between Birmingham and Chester; the steepest is about 1 in 60, I do not know accurately.

G. N. TYRRELL.

APPENDIX No. 3.

Great Western Railway,
Office of Superintendent of Line,
Paddington Station, London, W.

DEAR SIR, 27th February 1875.

WITH reference to your request on Wednesday, I now send you a copy of the instructions as to cord communication as issued in the year 1869, when it commenced. I have been out of town or I would have sent it sooner.

I beg to call your attention to the paragraph which states that when two vans are on the train, the communication should be made from the front van to the engine, but it would be better to make the communication from the engine to the rear van direct, as it would enable the rear guard to communicate with the front guard as well as the driver.

Also with regard to the first paragraph, it has been found necessary to appoint men at Paddington and other large stations purposely to see to the cord communications and test it before the starting of trains.

I am, dear Sir,
Your obedient servant,
G. N. TYRRELL.

Col. Yolland, C.E.,
Railway Department,
Board of Trade.

(Enclosure.)

PASSENGERS CORD COMMUNICATION.

Copy of the Instructions issued at the time the Cord Communication was adopted in 1869.

1. It will be the duty of the guards of trains running 20 miles without stopping, before their train is due to start, to see that the train is provided with the means of communication, and that all the bells and cords are in proper working order before the train is ready to start. This regulation will apply to the starting station, and to all stations at which the vehicles are attached to, or detached from, the trains. A testing signal (one pull) must be given by the guard to the driver, and one pull by the driver, as an acknowledgment.

2. The cords will be fixed on both sides of the coaches, but the communication to the guard and driver will only be joined together so as to be available for signalling on the right or six-foot side of the train while travelling.

3. So soon as the train is started the guard must see that the cam of the communication wheel fixed in his van is carefully adjusted to a distance of about 10 inches from the tongue of the bell which will be struck by the cam when the cord is pulled, so as to enable passengers to ring the bell with ease, and avoid any ringing or whistling which might otherwise be caused by the lengthening or contraction of the buffers, either when the train is leaving a station, after being brought to a stand, or in passing round a curve.

4. Each guard must carry with him six spare cords, fitted at both ends with cord couplings complete, to replace any cords which may be damaged on the journey, or may be required in the case of vehicles which may have to be attached being unprovided with cords.

5. When any vehicles are attached or detached at intermediate stations, or in the event of a train being re-marshalled during the journey, care must be taken that all the cords are properly adjusted so that the communication may be complete throughout the train, before it starts again; and in the case of vehicles which are detached, the cord-couplings of these vehicles must always be secured at both ends, on the hooks provided for the purpose, to prevent the cords being lost or damaged.

6. When the guard hears the bell ring, and the engine-driver hears the gong or whistle on his engine sound, they must at once look carefully along each side of the train; and in case any violent oscillation be noticed, or a carriage be on fire, or other occurrence of a serious character be observed, the train must be stopped as speedily as possible, and when stopped must be protected by signals, as prescribed in the Company's regulations. Should however the guard or engine-driver fail to observe anything which really necessitates an immediate stoppage of the train, the train must be stopped at the first station or junction where it can be properly protected by fixed signals.

7. When the train is stopped, the passenger who gave the signal may be expected to communicate with the guard, but should he fail to do so, the guard must ascertain from which compartment the signal was given, and obtain information as to the cause. Should the alarm have been mischievously given, or for an insufficient cause, the name and address of the passenger who pulled the cord must be obtained, failing which the names and addresses of all the passengers in that compartment must be taken in order that the passenger who has made use of the communication without reasonable or sufficient cause may be properly dealt with.

8. On arrival at the end of the journey, or where the train is transferred to another company, a testing signal is to be given by the guard, and acknowledged by the driver before the engine is uncoupled from the train. The fact must be recorded by the head guard in his journal, and he must likewise specially report any use that may have been made of the communication on the journey, and any failure in its action.

9. The guards in charge of trains that run a distance of more than 20 miles without stopping will be furnished with bells, which they will be responsible for, and which they must always remove from the train at the end of the journey, and lock them up with their detonating signals. At those stations where the guards have no lock-up place, they must deposit the bells, when off duty, with the station-master, who will during that time be responsible for their safe custody.

10. Each superintendent must see that he is supplied with a sufficient number of bells for the guards working from his division to serve out to them, taking their signatures for them, and also keeping two or three spare bells for special requirements.

11. The bells of the through trains to the Bristol and Exeter line must be removed from the trains at Bristol.

12. When there are two guards' vans to a train, or in the event of there being only one and it is in front of the train, the testing signal required by clauses Nos. 1 and 8 must be given from the last vehicle of the train to the van in front, and from the van to the engine.

13. When there is more than one guard to a train, the head guard is responsible for seeing that the above regulations are carried out.

APPENDIX No. 4.

ABSTRACT of ACCIDENTS reported upon by the Inspecting Officers of the Board of Trade as due to the Fracture or Flying off of Tyres from 1847 to 1874 inclusive.

Date of Accident.	Date of Report.	Name of Railway and Site of Accident.	No. of Persons killed.		No. of Persons injured.		Description of Tyre.	
			Passengers.	Servants.	Passengers.	Servants.	Engine, Carriage, &c.	Name of Patent and how fixed, by rivets or screws, &c.
1847	-	- -		-	-	Nil.		
1848. 12 Feb.	14 Mar. 1848.	Midland - - (near Chesterfield).		—	—	—	Carriage -	Fastened by five rivets. Manufactured at Park Gate Foundry. This carriage lost its hind wheels, the next carriage had its wheels stripped off and broke away from the rest of the train, and the guard's van following was turned over. No further particulars are given. This tyre had only been in use for six months, but was made of indifferent iron. The Inspecting Officer recommended a record to be kept of the services of tyres. (Capt. Simmons.)
20 Oct.	8 Nov. 1848.	Edinburgh and Northern (near Abernethy).	—	—	5	1	Engine -	Secured by five bolts ¾" in diameter. Manufactured at Low Moor. Flew off. Engine left rails and turned completely round, tender broke away and passed it, van following was thrown against the engine, the remaining four carriages stood upright in the ballast a little off the rails. Tyre had run 8,048 miles. Broke first at weld, and all the bolts gave way. (Capt. Simmons.)
1849. 17 Mar.	2 Apr. 1849.	London and North-Western Railway (near Chelford).	—	—	3	—	Carriage -	Bolted. Locke's pattern. Opened at weld, broke at another place, and flew off. 11 vehicles in the train. Tyre belonged to fifth from the rear. Trailing wheels became disengaged, and threw remainder of train off the rails. (Capt. Wynne.)
1850. 21 Jan.	4 Feb.	East Lancashire (Burscough).	—	—	2	—	Do - -	Tyre rivetted. Wheel manufactured by Losh, Wilson, and Bell, Newcastle. Tyre broke in five parts. Gave way at the rivet holes, and flew off. Broken carriage fell half-way down the embankment of 20 feet on its side, succeeding carriage was also thrown in advance of it and partly down the embankment, next and last carriage thrown on its side still further in advance and partly across the other line of rails. The engine also left the rails. (Capt. Wynne.)
1851. 18 Feb.	18 Mar. 1851.	London and North-Western Railway (near Adderley).	—	1	—	1	Engine -	Secured by six screw bolts. Manufactured by Messrs. Wilson, of Leeds. Gave way at weld. Supposed to have run 40,000 miles. Engine and several vehicles off the rails. (Capt. Laffan.)
14 July	27 Aug. 1851	Bristol and Exeter (name of place not given).	–	—	—	—	Carriage -	Bars welded together longitudinally and rolled into [illegible] Made by Patent Shaf[illegible] use about two yea[illegible] the weld. A [illegible] and did not s[illegible] (Capt. W[illegible]
1852. 13 Mar.	1 Apr. 1852.	London and South-Western (near Basingstoke).	—	2	*2	1	Engine -	[illegible]

* P.O. guard.

Date of Accident.	Date of Report.	Name of Railway and Site of Accident.	No. of Persons killed.		No. of Persons injured.		Description of Tyre.	
			Passengers.	Servants.	Passengers.	Servants.	Engine, Carriage, &c.	Name of Patent and how fixed, by rivets or screws, &c.
1852. 6 Aug.	18 Aug. 1852.	Midland - - (near Draycott).	—	—	—	—	Engine -	Bolted. Manufactured by Patent Shaft and Axle Co. Opened at weld, and apparently did not leave the wheel. Had been in use about six weeks. (Capt. Galton.)
1853. 21 Jan.	22 Apr. 1853.	Great Northern - (near Womersley).	—	—	2	2	Do. - -	Welded. Manufactured by Bowling Iron Co. Broke at weld. Engine and part of train left rails and fell down embankment. Tyre had run between 2,000 and 3,000 miles and 24,694 miles previously. Capt. Galton recommended that tyres should be tested.
10 Feb.	Do.	Great Northern - (near Newark).	—	—	—	—	Do. - -	Evans' patent, which dispenses with bolts. No damage to train. The scarf weld was short and very unsound. Engine had run 14,633 miles. (Capt. Galton.)
17 Mar.	Do.	Great Northern - (place not given).	—	—	—	—	Do. - -	Bolted. Made by Bowling Iron Co. Broke at weld, through which bolt passed. Had run 43,888 miles. Engine left the rails. (Capt. Galton.)
1 June	17 June 1853.	Leeds Northern - (near Ripon).	—	1	—	—	Do. - -	Bolted. Low Moor Iron Co. Flew off. (Capt. Simmons.)
22 Aug.	15 Nov. 1853.	York and North Midland (near Beverley).	2	—	4	—	Carriage -	Scarf welded. Train appears to have run about 400 yards after tire came off. Flew off. (Capt. Wynne.)
1854. 12 Jan.	1 Feb. 1854.	Midland - - (near Ambergate).	—	—	—	—	Do. - -	Broke in several places and flew off. Made by Patent Shaft Co. A van next the carriage left the rails. (Capt. Wynne.)
17 Apr.	16 May 1854.	Great Northern - (near Hornsey).	—		—	1	Van -	Gave way at weld and flew off. Made at Low Moor Works. Vehicle left the rails. (Capt. Wynne.)
23 Dec.	12 Jan. 1855.	Great Western - (West Bromwich).	*1	—	—	—	Engine -	Secured by eight rivets. Made by Hood and Cooper, Leeds. Flew off, stripping the heads off all the rivets. Had not run more than 2,000 miles. (Col. Yolland.)
			* Girl about to pass over the line at a level crossing.					
1855. 31 Jan.	7 April 1855.	Manchester, Sheffield, and Lincolnshire (near Hadfield).	—	1	—	—	Carriage -	Rivetted. Broke at weld and at another place not near a rivet hole and flew off. Made by Low Moor Iron Co. Had been running 6 years. Van following was thrown off the rails. (Capt. Tyler.)
19 Feb.	27 Mar. 1855.	North-Eastern - (near Cramlington).	—	—	3	—	Do. - -	Opened at weld and flew off. Carriage lost its wheels and dragged along without them. Made by Low Moor Iron Co., welded by Messrs. Sandford and Owen, Rotherham. Had been in use two years and eight months. (Capt. Tyler.)
20 Feb.	1 Mar. 1855.	South Devon - (Brent).	—	—	2	—	Do. - -	Rivetted. Broke at weld within one inch of a rivet which however was perfectly sound, and the end of the tyre had sprung outwards at this point about five or six inches, but remained in contact with the wheel at the next rivet distant about 27 inches, this rivet being also intact. Made at Low Moor Works, and had run several years. Three vehicles left the rails. (Lieut.-Col. Yolland.)
22 Feb.	6 Mar. 1855.	London and North-Western (Four Ashes).	—	—	—	—	Waggon -	Broken at weld and flew off. Made by Mr. John Ashbury, Manchester. This waggon left the rails. Had been in use about 13 months. (Capt. Tyler.)

Date of Accident.	Date of Report.	Name of Railway. and Site of Accident.	No. of Persons killed.		No. of Persons injured.		Description of Tyre.	
			Passengers.	Servants.	Passengers.	Servants.	Engine, Carriage, &c.	Name of Patent and how fixed. by rivets or screws, &c.
1855. 11 Dec.	3 Jan. 1856.	Great Northern - (near Ranskill).	—	—	—	—	Carriage -	Rivetted. One fracture at a rivet hole. Flew off. Vehicle left rails. Made at Bowling Works. Had run 2,000 or 3,000 miles. (Lieut.-Col. Yolland.)
1856. 16 Jan.	19 June 1856.	Great Northern - (near Tollington).		—	2	—	Do. - -	Broke at the weld. One vehicle left rails and fell on its side. Made of Low Moor iron, welded by Rayner and Burn. Had been in use about three years. Did not fly off apparently. (Lieut.-Col. Wynne.)
27 July	5 Aug. 1856.	Newcastle and Carlisle (near Haltwhistle).	—	—	—	—	Do. -	Broke at the weld and flew off. Made by Losh, Wilson, and Bell, Newcastle. Had been running about two years. Vehicle left the rails and the remaining carriages got off at a curve. (Capt. Tyler.)
3 Dec.	13 Dec. 1856.	Lancashire and Yorkshire (near Thornhill Lees).	—	—	—	—	Tender -	Bolted. Fracture was not at weld or bolt hole. Flew off. Leading wheels left the rails. (Capt. Tyler.)
1857. 8 May	26 May 1857.	Great Northern - (near Barnet).	—	—	—	—	Fish truck -	Rivetted. Broke through the four rivet holes and flew off. This vehicle and others left the rails. Col. Yolland.)
17 July	27 July	Glasgow and South-Western (near Dumfries).	—	—	2	1 mail guard.	Leading 3rd class carriage.	Tyre of leading 3rd-class carriage broke into two parts. Rivetted. One fracture through rivet-hole; the other through the solid. Made by Hood & Cooper, of Leeds, in 1856. Axle broken close to boss of wheel. Three carriages off the rails. (Col. Yolland.)
1858. 1 April	May 1858.	Manchester, Sheffield, and Lincolnshire (near Oxspring).	—	—	5	1	Carriage, two tyres broke.	A jolting carriage had been newly supplied with wheel tyres of a brittle nature. Two broke and flew off. Vehicle lost its trailing wheels, and leading wheels left the rails. Supplied by Blaenavon Iron Co. (Capt. Tyler.)
29 June	12 Aug. 1858.	Great Northern - (near Newark).	—	—	6	2	Engine -	Rivetted. Fractured through weld and a rivet hole. Impossible to say which occurred first. Flew off. Engine left rails. Made by Kirkstall Forge Co. Had run 10,120 miles. Attention first drawn to Beattie's process. Rivets to be disused on this line. Capt. Galton in his general report to Board of Trade for 1858 noticed that Beattie's Patent had been found remarkably successful in retaining a broken tyre on the wheel. (Col. Yolland.)
1859. 4 Jan.	27 Jan. 1859.	Bideford Extension (near Instow).	—	—	—	1	Do. - -	The tyre of malleable iron had been bored out and fitted on to a cast-iron sole $1\frac{3}{4}$-in. deep, with flanges to receive the wooden spokes of the wheel. Tyre had broken through the weld opened out rather more than an inch, and one side had sprung outwards to about the same extent. Cast-iron sole also fractured. Engine and part of train left the rails. Tyre made of Bowling iron by Head and Cooper, Leeds. Had run about 39,725 miles. (Col. Yolland.)
15 Jan.	18 Jan. 1859.	Lancashire and Yorkshire (near Hitchin), Great Northern train.		—	--	—	Do. - -	Rivetted. Gave way at weld, and breaking in several pieces, flew off. The wheel left the rails. Made of Low Moor Iron. Had run only 2,688 miles. (Capt. Ross.)

Date of Accident.	Date of Report.	Name of Railway and Site of Accident.	No. of Persons killed.		No. of Persons injured.		Description of Tyre.	
			Passengers.	Servants.	Passengers.	Servants.	Engine, Carriage, &c.	Name of Patent and how fixed, by rivets or screws, &c.
1859.								
16 Dec.	19 Jan. 1860.	London and North-Western (near Wolverton).	One servant was killed and two injured by a collision which followed.				Waggon -	Broke in several pieces, first at a flaw, and flew off. Several waggons left the rails. This waggon belonged to the Shipley Colliery Company. (Capt. Tyler.)
18 Dec.	19 Jan. 1860.	Midland - - (near Wichnor).	--	—	1	—	Carriage -	Secured by four bolts. Supplied by Patent Shaft Company. Broke in several pieces, and flew off. First fracture evidently took place at a bolt hole. Had run about 60,000 miles. Vehicle lost all its wheels, and following ones left the rails. (Col. Yolland.)
28 Dec.	14 Jan. 1860.	South Staffordshire (near Birmingham).	1	—	3	—	Do. - -	Rivetted on at five holes. Broke in two pieces, and flew off. First fracture at weld, through which a rivet hole passed. Vehicle left the rails, made of Low Moor iron. Officer mentioned the advantage of Beattie's patent. (Col. Yolland.)
1860.								
20 Feb.	20 Mar.	Eastern Counties - (Tottenham).	5	2	9		Engine -	Bolted. Broke in several pieces, and flew off. First gave way at a flaw in the weld. Engine left rails. Had run 270,000 miles. Officer calls attention to Beattie's patent as being a successful method of fastening. (Capt. Tyler.)
5 June	26 June	Great Northern - (near Southgate).	—	—	—	—	Carriage - (Belonging to Board of Directors of Scotch Prisons, maintained by North British Railway Company.)	Bolted. Opened at the weld only, and flew from the wheel. Vehicle left the rails. Officer called attention to dovetailing process. Beattie's found to yield excellent results. (Capt. Tyler.)
26 Dec.	8 Jan. 1861.	Manchester, Sheffield, and Lincolnshire (near Gainsboro').	—	—	7	—	Carriage -	Fastened by four rivets. Broke at three rivet holes, and flew off. Hinder part of vehicle was broken up. Thought to be 13 years old. (Col. Yolland.)
26 Dec.	31 Jan.	North Staffordshire (near Weston).	1	—	8	—	Do. - -	Rivetted. Opened at defective weld, fractured five rivets. and flew off. This and the other vehicles upset made of Low Moor. Capt. Tyler said "By "avoiding rivet holes through "the tyres they will add about "one fifth to their strength, and "by dovetailing them to the "rims of the wheels they will "go far to prevent all risk of "their flying off from those "wheels in the event of any "accidental fracture."
1861.								
4 Jan.	28 Jan.	Shrewsbury and Hereford (near Dinmore).	2*	—	2	1	Carriage -	Fixed by four rivets. Broke in four pieces and flew off. It was surmised that first fracture occurred at a rivet hole. Vehicles ran down an embankment and overturned. Col. Yolland considered railway companies should be held responsible for continuing to fix tyres by means of bolts or rivets, and named superior methods.
4 Jan.	7 Feb.	London, Chatham, and Dover (near Teynham).	1	—	2	-	Van of passenger train.	Fastened by four rivets. Rolled out not welded. Broke in five pieces, first at a rivet hole, and flew off. This and two other vehicles left the rails. Capt. Tyler examined and described the different modes of fastening them employed.

* Drowned.

Date of Accident.	Date of Report.	Name of Railway and Site of Accident.	No. of Persons killed.		No. of Persons injured.		Description of Tyre.	
			Passengers.	Servants.	Passengers.	Servants.	Engine, Carriage, &c.	Name of Patent and how fixed, by rivets or screws, &c.
1861. 14 Jan.	21 Feb. 1861.	Great Western - (near Twyford).	—	—	—	—	Carriage - (Bristol and Exeter Company's property.)	Beattie's process. Made by Lloyd's Foster, of Wednesbury. Gave way at weld and flew off. Vehicle left rails. Had run 22,547 miles. In 1854 the company decided upon adopting a new mode of fastening, and in the year 1861 all their rolling stock but 500 pairs of wheels had been placed on this improved footing. (Col. Yolland.)
3 Jan.	23 Feb.	London and North-Western (near Berkhampstead).	—	—	7	—	Carriage - (belonging to Caledonian Company).	Fixed by five rivets. Wheel made by Mr. Ashbury, Manchester. Broke at three rivet holes and flew off. Flaw at one hole. This vehicle and others left rails. Tyre had run 8,900 miles. Col. Yolland said fracture was facilitated by vicious practice of boring holes through the tyres and then driving in rivets. (Col. Yolland.)
10 Jan.	6 Feb.	London and North-Western (near Bangor).	—	—	—	—	Carriage -	Broke in six pieces and flew off. Vehicle left rails and fell into a ditch. Capt. Tyler remarked that this was an accident to be avoided by securing tyres in an improved manner to suitable wheels.
14 Jan.	4 Mar.	London and North-Western (near Pinner).	—	—	4	—	Do. -	Fixed by six rivets. Broke in six pieces and flew off. Vehicle left rails and fell into a ditch. Capt. Tyler remarked that this was an accident to be avoided by securing tyres in an improved manner to suitable wheels. (Capt. Tyler.)
14 Jan.	5 Feb.	Manchester, Sheffield, and Lincolnshire (near Lincoln.)	1	1	3	2	Engine -	Fixed by five rivets. Low Moor manufacture. Broke in five pieces and flew off. Doubtful whether first fracture was through rivet hole or weld. Engine and also the vehicles left rails and fell over. (Capt. Tyler.)
27 Feb.	30 Mar.	London and North-Western (Tring).	—	—	—	—	Carriage -	Opened at very defective weld and left the wheel. Vehicle left rails. Gibson's patent. Made by Patent Shaft Co. Indifferent workmanship. (Col. Yolland.)
1862. 15 Nov.	2 Dec. 1862.	Caledonian - - (Beattock incline).	1	—	10	2	Engine -	Fixed by five bolts. Made of Low Moor iron. Manufactured by Messrs. Cooper. Broke in three pieces through three bolt holes and weld. Impossible to say whether first fracture was at bolt hole or weld. Engine left rails and fell over, all the vehicles also left rails, and most of them upset. Had run 2,700 miles. Objection taken to the mode of fastening adopted by bolts. (Col. Yolland.)
1863. 4 April	18 April 1863.	Great Northern - (near Little Bytham).	—	—	3	—	Do.	Gave way at weld. Flew off and was found in three pieces. Beattie's patent. Made by Taylor Bros., Leeds. Engine and vehicles left rails, most of them being upset. Had run about 30,000 miles. Attention directed to Mansell's and Brotherhood's system of tyre-fastenings. (Capt. Tyler.)
1864. 5 Feb.	22 April 1864.	Caledonian - - (near Bishopton Tunnel).	1	—	3	—	Carriage -	Secured by four bolts. Made by Hood and Cooper, Leeds. Failed at weld, broke at one bolt hole, and flew off. Nothing left rails. Had been reduced in thickness by wear and tear from $1\frac{1}{2}''$ to $\frac{7}{8}''$. Attention called to Mansell's process. (Capt. Tyler.)

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			Passengers.	Servants.	Passengers.	Servants.	Engine, Carriage, &c.	Name of Patent and how fixed, by rivets or screws, &c.
1865. 21 Mar.	18 Apr. 1865.	Great Western - (near Pangbourne).		—	--	—	Carriage -	Opened at very defective weld, and flew off. Gibson's patent. Wheel broken to pieces, but nothing left the rails. Had been running about 6½ years. Attention called to Mansell's and Brotherhood's methods of fastening tyres on wheels. (Capt. Tyler.)
1866. 12 Nov.	5 Dec. 1866.	North British - (Spittal siding).	1	—	5	—	Waggon - (Travelling with a passenger train.)	Fixed by four rivets. Made by Cooper, Leeds. Broke at a rivet hole, and flew off. All vehicles left rails. Had been running about six months. Objection taken to running goods waggon placed in front with a passenger train. (Major Rich.)
1867. 23 Mar.	29 Apr. 1867.	Glasgow and South-Western (near Kirkconnell).	—	—	1	1	Engine -	Secured by six bolts. Made of cast steel by Naylor Vickers, Sheffield. Broke at a bolt hole, and flew off. Engine left rails, and fell over, and vehicles also left rails. Every bolt broke at shoulder. Had run about 80,000 miles. No company justified in fastening on wheels by such a process. (Col. Yolland.)
1868. 27 Nov.	29 Sept. 1868.	Great Eastern - (near Brentwood).	—	—	3	—	Do. -	Broke in four pieces, and left wheel. Beattie's patent, as applied to carriage and waggon wheels. Made by Krupp, of Berlin. Broke in four pieces, and left the wheel. Defect in steel at first fracture. Nothing left rails. Had run 165,402 miles. This method was not sanctioned by Mr. Beattie for engine wheels after 1861. (Lieut.-Col. Hutchinson.)
2 Nov.	2 Dec.	Midland - - (near Hunslet).	—	—	—	—	Do. - (North-Eastern train.)	Fastened by six bolts, all of which broke. Opened at defective weld, and flew off. Only leading wheels of engine left rails. Tyre made of wrought iron. Had run 16,149 miles. Allusion is made to the imperfect mode by which the tyre was fastened to the wheel. (Lieut.-Col. Hutchinson.)
31 Oct.	2 Jan. 1869.	Vale of Towy - (near Glanchyd).	—	--	10	—	Do. - (Joint train of L. & N.W. and Llanelly Ry. Companies.)	Secured by six bolts and by a method somewhat resembling Beattie's. Broke in several places, and flew off. Probably gave way first at bolt hole. Engine left rails, and fell over tender, and all other vehicles also left rails. Engine was supplied by Kitson & Co., Leeds. Had run 18,327 miles. All the other bolts were broken off short. Tyre made of cast steel. Attention called to other modes of securing tyres to wheels. (Lieut.-Col. Hutchinson).
1869.		Nil.						
1870. 7 June	9 July 1870.	Lancashire and Yorkshire (near Hoghton).	2	—	27	—	Carriage -	Fastened by four rivets. Broke at a rivet hole, and flew off. Made of Bessemer steel by Cammell & Co., Sheffield, and rolled out, having no weld. Vehicle lost all its wheels. Seven other pairs of wheels were torn off and the vehicles left the Had only been ru- months. Officer

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			Passengers.	Servants.	Passengers.	Servants.	Engine, Carriage, &c.	Name of Patent and how fixed, by rivets or screws, &c.
1870. 26 Dec.	28 Jan. 1871.	Great Northern - (Hatfield).	6 (Two women walking along the line were killed, and two others severely injured.)	—	1	—	Break-van - (Passenger train.)	Broke in six pieces, and flew off. Beattie's patent. Weldless steel tyre, supplied by Cammell & Co., Sheffield. This vehicle and nearly all the others left rails, and many were upset and severely damaged. None of the fractures through bolt holes. Three bolts broken. Had been running only about two months. Attention called to the necessity for adopting a more secure method of fastening tyres. (Lieut.-Col. Hutchinson.)
30 Dec.	18 Feb. 1871.	London and North-Western (near Barton and Holme).	—	—	5	1	Break-van - (Passenger-train). (Belonging to the Caledonian Ry. Co.)	Fixed by five bolts. Made by Frinley & Co., Bradford. Broke in four pieces, and flew off. First fracture probably through a defective bolt hole. This and other vehicles left rails, and ran down an embankment with 24 or 25 passengers. Not known how much longer than four years it had been running. Attention called to Mansell's system. (Col. Yolland.)
1871. 5 Jan.	7 Feb. 1871.	Great Northern - (near Huntingdon).	—		2	2	Carriage - (Manchester, Sheffield, and Lincolnshire Co.'s property.)	Secured by four rivets. Weldless steel tyre, made by Vickers & Co. Broke in several pieces, but not at a rivet hole, and flew off. Vehicle lost its trailing axle, and turned over. No fracture at a rivet hole, but three rivets were broken off. Tyre had worn from 2″ to 1⅝″. Necessity of securing tyres by some method which will prevent them flying off when fractured. (Lieut.-Col. Hutchinson.)
17 Jan.	27 Feb. 1871.	Midland - - (near Draycott).	—	—	—	—	Break-van - (Passenger train.)	Secured by four bolts. Made of wrought iron, supplied by Patent Shaft Co. Broke in three pieces through bolt holes, and flew off. This vehicle and others left rails. Had run about six months. Mansell's wheels recommended. (Lieut.-Col. Hutchinson.)
3 Jan.	13 Feb. 1871.	Midland Great Western of Ireland (near Oranmore).	—	—	—	—	Carriage -	Broke in two places and flew off. Made of Low Moor iron. Cabry's patent. Had been delivered eight years before breakage. (Lieut.-Col. Rich.)
8 Dec.	21 Dec. 1871.	Midland - - (near Kingsbury-wood Colliery).	—	—		—	Engine -	Fixed by seven screw bolts. Made of crucible steel by Taylor Bros., Leeds. Broke in two pieces and flew off. Nothing off the rails. Had run 80,110 miles. Desirability of a more secure mode of fastening being adopted. (Capt. Tyler.)
10 Dec.	21 Dec. 1871.	Midland - - (near Borrowash).	—	—	—	—	Do. - -	Fixed by seven screw bolts. Tyre made of crucible steel by Taylor Bros. Broke in three pieces and flew off. First fracture probably occurred at a bolt hole. Nothing off the rails. Had run 87,800 miles. Attention called to other modes of securing tyres to wheels that will prevent their flying off in case of fracture. (Capt. Tyler.)

Date of Accident.	Date of Report.	Name of Railway and Site of Accident.	No. of Persons killed.		No. of Persons injured.		Description of Tyre.	
			Passengers.	Servants.	Passengers.	Servants.	Engine, Carriage, &c.	Name of Patent and how fixed, by rivets or screws, &c.
1871. 12 Oct.	14 Nov. 1871.	North-Eastern - (near Leamside).	—	—	2	—	Do. - -	Fastened by four bolts and a patent clip on the outer side. Broke in four pieces and flew off. No fracture at a bolt hole. Engine and tender and several vehicles left the rails. Weldless crucible cast-steel tyre supplied by Taylor Bros. Had only run between 700 and 800 miles. Mansell or Brotherhood's process recommended. (Col. Yolland.)
1 Nov.	8 Dec.	North-Eastern - (near Killingworth).	—	—	7	2	Horse box -	Secured by four bolts. Made by Butcher and Co., Sheffield, of cast steel and rolled out. Broke in three pieces, but not at a bolt hole. Flew off. Gave way at a flaw. Great derailment. Three pairs of wheels torn off. No fracture at bolt hole. Two bolts sheared off. Been running nearly six years. Officer pointed out importance of having tyres properly secured to the wheels. (Lieut.-Col. Hutchinson.)
24 Nov.	30 Dec. 1871.	North - Eastern (near Bradbury).	—	—	—	—	Carriage -	Beattie's patent. Made of cast-steel rolled out, and sold by Vickers & Co. Broke in three pieces, and flew off. Vehicle left rails. Running about three or four years. Allusion is made to other successful methods of securing tyres to wheels. (Lt.-Col. Hutchinson.)
1872. 2 Feb.	16 Feb. 1872.	Lancashire and Yorkshire (Cooper Bridge).	—	—	2	—	Tender -	Fastened by four rivets. Broke at rivet holes, and flew off. Derailment. Made of Low Moor iron. Attention called to Mansell's and Gibson's method of fastening. (Col. Rich.)
17 Sept.	10 Oct. 1872.	Great Southern and Western of Ireland (near Mallow).	—	—	1	—	Carriage -	Fixed by five screw bolts. Cast-steel tyres made by Taylor, Leeds. Broke in four pieces, and flew off. Three fractures at bolt holes. Derailment. Had been in use about two years. Attention called to Mansell's system of fastening tyres on wheels. (Lt.-Col. Rich.)
16 Oct.	15 Nov. 1872.	Midland (near Dronfield).	—	—	2	—	Do. -	Secured by four bolts. Made by the Patent Shaft & Axle Co. Broke in four pieces; three fractures through bolt holes; and flew off. This and two other vehicles thrown off the rails. In use about three months. The sooner improved tyre fastenings are fitted to the remainder of the stock the better. (Capt. Tyler.)
6 Dec.	17 Jan. 1873.	Midland (near Ambergate).	1	—	3	—	Horse-box -	Fastened by four rivets. Supplied by Patent Shaft & Axle Co. Broke at a rivet hole, and left the wheel. This vehicle did not leave the rails, but others did. Only been in use about a month. Attention called to Mansell's plan of tyre fastenings. (Col. Rich.)

Date of Accident.	Date of Report.	Name of Railway and Site of Accident.	No. of Persons killed.		No. of Persons injured.		Description of Tyre.	
			Passengers.	Servants.	Passengers.	Servants.	Engine, Carriage, &c.	Name of Patent and how fixed, by rivets or screws, &c.
1873. 6 Jan.	9 Jan. 1873.	Midland (near Royston).	—	—	1	—	Engine -	Secured by six screw bolts. Made of crucible steel by Taylor Bros. Broke into six pieces, and flew off. Three fractures at bolt holes. Engine left rails, together with vehicles. Had run 50,438 miles. Company had decided upon adopting a new method of fastening. (Capt. Tyler.)
8 Jan.	20 Mar. 1873.	Midland (near Dore).	—	—	1	—	Carriage -	Attached by four rivets. Made by Patent Shaft & Axle Co. Broke in six pieces, and flew off. Three fractures through bolt holes. No derailment. Thickness has been reduced from 2″ to 1¾″. Rather less than a quarter of its presumed life. Improved tyre fastenings should be applied with all possible expedition. (Capt. Tyler.)
28 April	12 May 1873.	Midland (near Stenson Junction).	—	—	—	—	Engine -	Fastened by seven bolts. Broke in seven pieces, and flew off. One fracture through a rivet hole. No derailment. Had worn 1⅛″ in tread. Attention called to the desirability of using tyre fastenings that will not fly off when they fracture. (Col. Rich.)
1 May	19 May 1873.	Great Western (near Upton Magna) Joint Line L. & N. W. and G. W.	—	—	11	1	Van (passenger train).	Gibson's patent. Broke in five pieces, and flew off. Vehicle smashed, and many others fell down embankment. Had worn ⅛″ in tread. (Col. Rich.)
21 June	31 Dec. 1873.	Midland (near Wingfield).	2	—	12	4	Engine -	Secured by eight bolts. Made of crucible steel by Monk Bridge Iron Co. Broke in five pieces, and flew off. Engine, tender, breaksman, and four carriage thrown off rails. Had run 117,154 miles. Capt. Tyler made a general report in this case, pointing out the best methods of fastening tyres.
29 Dec.	30 Jan. 1874.	Great Northern (near Huntingdon).	—	—	1	1	Break - van (passenger train).	Beattie's patent. Broke into three pieces, and flew off. Vehicle fell down the embankment, and was shattered to pieces. Steel tyre made by Vickers & Co. Had been in use about 4½ years. Attention called to the insecurity of Beattie's patent clip fastening. (Col. Yolland.)
12 Dec.	9 Jan. 1874.	Midland (Spondon)	—		—	—	Engine -	Fixed by six screw bolts. Made of crucible steel by Taylor Bros. Broke in seven pieces, and flew off. Two fractures at bolt holes. Leading wheels of engine left rails. Had run 89,011 miles. Greater necessity for employing safety tyre fastenings with steel than iron tyres. (Capt. Tyler.)
2 Sept.	19 Sept. 1873.	North-Eastern (near Hartlepool).	3	—	4	3	Engine -	Fastened by six rivets. Tyre became entirely loose, in consequence of packing dropping out and rivets giving way. Packing done at company's workshops. Engine, tender, and three leading coaches left rails. (Col. Rich.)

Date of Accident.	Date of Report.	Name of Railway and Site of Accident.	No. of Persons killed.		No. of Persons injured.		Description of Tyre.	
			Passengers.	Servants.	Passengers.	Servants.	Engine, Carriage, &c.	Name of Patent and how fixed, by rivets or screws, &c.
1873, 13 Dec.	4 Feb. 1874.	North-Eastern (near Guisboro' Junction).	—	—	—	—	Tender -	Secured by three rivets. Made of Low Moor iron; nearly new. Came off without breaking. No derailment. Insufficient means of attaching tyre to wheel pointed out. (Col. Hutchinson.)
1874. 8 May	29 May 1874.	Dublin, Wicklow, and Wexford (Blackrock).	—	—	1	2	Carriage -	Lloyd's A 1. Rivets did not give way. Broke at weld. Had worn half inch since 1863. Not clear whether tyre flew off, but cast-iron frame broke to pieces. Engine and vehicles left the rails. (Col. Rich.)
17 July	31 Aug. 1874.	North-Eastern (near Chathill).	—	—	3	1	Waggon (Caledonian Company's).	Secured by four bolts. Supplied by North of England Waggon Co. Had been delivered about five months. Broke through bolt holes into two quarters and one half, and flew off. Vehicle lost all its wheels; others thrown off rails. Tyre of an inferior description of iron. Waggons of this desciption should not be placed in the front part of a passenger train. (Col. Hutchinson.)
		Total -	31	8	203	33		

APPENDIX No. 5.

List of Witnesses.

1st Day, Monday, February 1st.

1. Hugh Hughes, station superintendent, Paddington.
2. James William Gibbs, station-master, Oxford.
3. William Tombs, yard inspector, Paddington.
4. Henry Richardson, engine-driver.
5. James Hill, fireman.
6. William Butler, engine-driver.

2nd Day, Tuesday, February 2nd.

7. William Henry Money, fireman.
8. William Garlick, foreman to locomotive superintendent, Oxford.
9. John Peach, station-master, Reading.
10. Edward Hermon, ganger 67¼ miles to 69¾ miles.
11. Charles Jones, ganger 69¾ miles to 71¾ miles.
12. John Price, head guard of the 10 a.m. train.
13. William James Taplin, cord communicator examiner, Paddington.
14. Joseph Adkins, travelling inspector on Great Western Railway.
15. Charles Proctor, carpenter on Great Western Railway, passenger in 10 a.m. train.
16. George Thatcher, carriage examiner, Oxford.
17. Thomas Barton, carriage examiner, Oxford.
18. James Eddles, lamp boy, Oxford.
19. George Gurney, foreman porter, Oxford.
20. Thomas Hewitt, foreman porter, Oxford.
21. Edwin Butler, policeman, Roundham crossing.
22. Thomas Phelps, signalman, Wolvercote junction.
23. Henry Holt, policeman, Woodstock Road.
24. Charles Francis Dobson, inspector permanent way, Oxford.

3rd Day, Wednesday, February 3rd.

Charles Francis Dobson recalled.

25. Henry Truscott, station inspector, Oxford.
26. Japh ah Hill, carriage fitter on Great Western Railway, Newport.
27. Joshua Harcombe, foreman of the Worcester Carriage Works.
28. John Thompson, locomotive foreman, Oxford.
29. Alfred James Phipps, policeman, Paddington.
30. Richard Christopher Mansell, carriage superintendent of the South-Eastern Railway.

4th Day, Thursday, February 4th.

31. Edward Jeffries, manager of Lowmoor Iron Works.
Richard Christopher Mansell recalled.
32. Thomas Shirley, platelayer on Great Western Railway.

5th Day, Friday, February 5th.

33. William Hurst, locomotive superintendent of the Lancashire and Yorkshire Railway.
34. George Major, manager of carriage and waggon works of Great Western Railway, Coulham, Shrewsbury.
35. Alphonso Raymond, assistant district engineer's office, Oxford.
36. Thomas Allen, superintendent for the supply of carriages on Great Western Railway
37. William Dean, assistant superintendent of carriage and locomotive department, Swindon.

6th Day, Saturday, February 6th.

38. Joseph Garner, machinist, Birmingham, passenger.
William Dean, assistant superintendent of locomotive and carriage department, Swindon, recalled.

7th Day, Monday, February 8th.

William Dean recalled.
39. Joseph Armstrong, chief of locomotive and carriage department, Swindon.

8th Day, Wednesday, February 10th.

40. Charles Lewis, merchant, passenger.
41. William Hill, under guard on Great Western Railway.
42. John Edward Ridd, telegraphic linesman on Great Western Railway, passenger.

9th Day, Thursday, February 11th.

43. Henry Stevens, engineer on Great Western Railway, Oxford.
Joseph Armstrong recalled.
44. James Edward McConnell, consulting engineer.

10th Day, Friday, February 12th.

45. Joseph Tomlinson, locomotive superintendent of the Metropolitan Railway.
46. Samuel Lack Mason, engineer.
47. George Frederick Tyrrell, superintendent of Great Western Railway.
Joseph Armstrong recalled.

11th Day, Saturday, February 13th.

48. John Chilton, station-master, Leamington.
49. Edward Wilson, consulting engineer.
William Dean recalled.
50. James Grierson, general manager of Great Western Railway.

12th Day, Wednesday, February 24th.

51. Richard Bore, carriage superintendent of London and North-Western Railway.

APPENDIX No. 6.

LIST of PASSENGERS KILLED in the Accident at Shipton-on-Cherwell on the 24th December 1874.

Name.	Name.
Barker, Aggie.	Hughes, John Thomas.
Bryant, Hannah.	Harper, John Howard.
Busby, Samuel.	Johnson, Henry.
*Baker, Mary Evans.	Laverick, Margaret.
Cartwright, Richard.	Morris, Albert.
Cavannah, William.	Pearson, Jane.
Cooley, Capt. Chas. J.	Pilkington, John Thomas.
*Cæsar, Charles.	Pilkington, John Augustus.
Danby, John E.	Richard, Dr. John Edward.
Donohoe, Catherine.	Shaw, Joseph.
Ellis, James.	Sylvester, Edward.
*Fryer, Zillah.	Taylor, Benjamin.
Fowler, Albert.	Tromp, H. E. Van.
[redacted] John.	White, Mrs.
[redacted]ge.	Williams, Humphrey.
	Yeates, Mrs. Sarah.
	*Yeates, Fanny.

[redacted]ersons have died since the accident.

List of Passengers Injured in the Accident at Shipton-on-Cherwell on the 24th December 1874.

Name.	Nature of Injury.
The Rev. C. K. Dean	Injury to left leg and head.
Joseph Farrington	Injury to head and chest.
Johnson, William	Broken leg.
Tongue, George	Broken arm and laceration of eyebrow.
Moffatt, Hector	Contusions.
Ridd, John Edward	Fracture of left arm. Concussion and laceration of face.
Hopkinson, William	Severely shaken and bruised.
Barrs, G. W.	Do.
Higgins, Edward	Do., and contusion of shoulder.
Lillie, Frederick	Lacerated eyebrow and shaken.
Chamberlain, William	Severe contusions.
Lewis, Charles	Compound fracture of ankle joint.
Symonds, Joseph	Right arm amputated and laceration of scalp.
Love, George	Contusion of rib and back.
Pearce, Thomas	Fractured rib.
Woodhouse, John P.	Severely shaken.
Hildey, George	Injury to shoulder.
Phillips, John	Lacerated hand and contused hip.
Clarke, Joseph	Laceration of scalp.
Watmore, Phillip	Laceration of scalp and compound fracture of arm.
Turner, Henry	Laceration of ankle.
Gibbs, Alfred	Contusions of chest.
King, Charles	Severe laceration of scalp and arm.
Lillie, Mary	Severe bruise of face.
Falconer, Charlotte	Injury to elbow.
Wait, Jane Elizabeth	Injury to arm and back.
Wood, Jane	Lacerated chin.
Banks, Selina	Laceration of scalp and bruised.
Griffiths, Mary	Laceration of face and contusions.
Danby, Keziah	Compound fracture of arm.
Welden, Alice	Fracture of ribs.
Turner, Mary	Fracture of thigh and of both bones of other leg.
Lillie —— (child)	Laceration of scalp.
Danby, Ann	Injury to foot.
West, Virginia G.	Contusion of leg.
Boyce, Mary Ann	Lacerated forehead and contusions.
Dee, George	Injury to back and shoulder.
Muller, John	Lacerated scalp and contusions.
Banks, John	Injury to back and side.
Harley, William	Broken ribs.
Hill, William (guard)	Severe laceration of scalp.
Price, John (guard)	Severely bruised and shaken and head injured.
Garner, George	Concussion of brain.
Reed, Wilmer	Concussion of brain and supposed fracture of base of skull.
Altree, Mrs.	Scalp wound and cut lip.
Do. (child)	Fractured arm.
Lloyd, William Hawley	Injury to arm, contusion of leg, and scalp wound.
Sellars, Mrs.	Shaken and blow on chest.
New, Mrs.	Fractured collar-bone and scalp wound.
Simpson, Mrs.	Laceration of scalp.
Do. Lawrence	Do.
Green, Elizabeth	Lacerated scalp and contused right shoulder.
Cook, Mrs.	Contusion of sacrum.
Do. (child)	Contusion right thigh.
Gerrard, Albert	Contusion of trunk. Internal injuries.
Banks, Mrs.	Dislocated shoulder. Shaken.

Name.	Nature of Injury.
Gowan, Miss Caroline	Concussion of brain.
Do. Mrs.	Shaken.
Thompson, Miss	Injury to back.
Hubbert, Miss	Injury to leg. Shaken.
Taylor, Mr.	Injury to back. Laceration of scalp.
Brentnall, Mr.	Cut lip.
Field, Edward	Blow on chest.
Hook, The Rev.	Do.
Paton, Mr.	Fractured head of humerus.
Parker, The Rev. S.	Contusions.
Akrill, Charles	Do.
Cheer, Mr.	Shaken. Blow on chest.
Barker, Annie	Fractured base of skull.

APPENDIX No. 7.

SUMMARY of MANSELL'S WOODEN WHEELS made from 1st January 1862 to 31st December 1874.

Under the Old Patent, up to 24th April 1866.

	Sets.
By Patent Shaft and Axletree Co. (sole licensees)	2,859½
„ Lloyds, Foster, & Co., for Patent Shaft Co.	1,084½
	3,944

On the Improved Patent, from 25th April 1866 to 31st December 1874.

		Sets.
By Patent Shaft & Axletree Co. (92 sets of these went to Great Western		7,242½
„ Lloyds, Foster, & Co.		877½
„ Great Western Railway	2,582½	2,795
„ Vulcan Foundry Co. for Great Western Railway	212½	
„ Leeds Wheel & Axletree Co.		441½
„ Midland Railway Co.		367
„ Ashbury Co.		353½
„ Vickers, Sons, & Co.		343½
Exclusive of South-Eastern Railway		12,420½
Add by South-Eastern Railway (mainly the improved)		4,395
Total wood wheels on the improved patent only		16,815½
„ old „		3,944
Total wood wheels, old and improved patents		20,759½

DEAR SIR, Ashford, Kent, 6th February 1875.

IN reply to yours of yesterday, the dates of the respective supplies of wood wheels with my patent fastenings, and the quantities, to the London and North-Western and Great Western Railways, under my old and new patents, were as follows:—

Under my Old Patent.

Dates,— Half-year ending	London and North-Western Railway. Sets of 4 wheels.	Great-Western Railway, made by Patent Shaft Co. Sets of 4 wheels.
30th June 1862	100	—
31st Dec. „	117	—
30th June 1863	23	—
31st Dec. „	38	—
30th June 1864	132	—
31st Dec. „	100	—
30th June 1865	—	—
31st Dec. „	—	5½
From 1st January 1866 to 24th April 1866	138½	56½
Totals on old patent	648½	62

Under my Patent of 1865.

The London and North-Western Railway Company purchased the use of this in January 1867, and I have no returns of the quantity they have had since. The returns for the Great Western Railway are as follows :—

Date,— Three Months ending	Quantity in Sets.	Date,— Three Months ending	Quantity in Sets.	Date,— Three Months ending	Quantity in Sets.
31st Dec. 1868	40	Brought forward	332½	Brought forward	1,841½
31st Mar. 1869	53½	31st Mar. 1871	65	31st Mar. 1873	113½
30th June „	44	30th June „	81½	30th June „	137½
30th Sept. „	—	30th Sept. „	89½	30th Sept. „	149½
31st Dec. „	25	31st Dec. „	254	31st Dec. „	102
31st Mar. 1870	105	31st Mar. 1872	306½	31st Mar. 1874	104½
30th June „	35	30th June „	280	30th June „	113
30th Sept. „	2	30th Sept. „	188½	30th Sept. „	134½
31st Dec. „	28	31st Dec. „	244	31st Dec. „	191
Carried on	332½	Carried on	1,841½	Total	2,887

SUMMARY.

	Old Patent.	New Patent.	
London and North-Western Railway	648½	No return.	648½
Great Western Railway	62	2,887	2,949
Totals	710½	2,887	3,597½

Yours very truly,
RICH. C. MANSELL.

Col. Yolland, R.E., &c.,
Board of Trade,
1, Whitehall, London.

APPENDIX No. 8.

LONDON AND NORTH-WESTERN RAILWAY.

MANSELL'S PATENT WHEELS put under Carriage Stock since 1861.

For Year ending December 31st,	1861	400 Pairs.
„	1862	422 „
„	1863	126 „
„	1864	500 „
„	1865	382 „
„	1866	808 „
„	1867	772 „
„	1868	555 „
„	1869	627 „
„	1870	654 „
„	1871	1,078 „
„	1872	1,218 „
„	1873	1,048 „
„	1874	1,037 „
To February 6th of Year 1875		112 „
	Total	9,739 „

R. BORE.

APPENDIX No. 9.

GREAT WESTERN RAILWAY.

STATEMENT showing Description of Wheels under Passenger Carriages and Vans, 17th January 1875.

	Broad Gauge Stock.	Narrow Gauge Stock.	N.G. Stock recently transferred from L. & O. and L. R. & D. Cos.	Total G.W.R. Stock.
NUMBER OF VEHICLES.				
With wood wheels, Mansell's fastening	38	1,242	8	1,288
„ iron „ Gibson's „	524	789	7	1,320
„ „ „ Burke's „	1	—	—	1
„ „ „ Beattie's „	—	—	2	2
„ „ „ rivetted	10	47	17	74
Not yet examined	14	34	—	48
Total	587	2,112	34	2,733
NUMBER OF PAIRS OF WHEELS.				
Wood wheels, Mansell's fastening	115	3,128	15	3,258
Iron „ Gibson's „	1,610	1,567	13	3,190
„ „ Burke's „	5	—	—	5
„ „ Beattie's „	—	—	4	4
„ „ rivetted	30	115	36	181
Not yet examined	40	68	—	108
Total	1,800	4,878	68	6,746

APPENDIX No. 10.

GREAT WESTERN RAILWAY.

January 1875.

STATEMENT showing Number of Mansell's Wood Wheels made and purchased by Great Western Railway Company.

Year.	Maker.	No. of Pairs of Wheels.			
		4′ 0″ Diameter. B.G.	3′ 6″ Diameter. N.G.	3′ 0″ Diameter. N.G.	Total.
1866	Patent Shaft Co.	—	219	—	219
1867	„	—	185	—	185
1868	„	—	80	—	80
1869	„	—	50	—	260
„	Vulcan Foundry Co.	—	210	—	
1870	Patent Shaft Co.	50	—	4 B.G.	332
„	Vulcan Foundry Co.	—	230	—	
„	Great Western Railway Co.	40	8	—	
1871	„	9	591	380	980
1872	„	—	683	1,355	2,038
1873	„	18	660	472	1,150
1874	„	18	734	334	1,086
	Total	135	3,650	2,545	6,330

APPENDIX No. 12.

GREAT WESTERN RAILWAY.

STATEMENT showing WEIGHT, LENGTH, &c. of 11.40 AM. Down Passenger Train from Oxford, December 24th, 1874.

No.	Class of Vehicle.	No. of Wheels.	No. of Compartments. 1st Class.	2nd Class.	3rd Class.	Guards and Lug.	Length over Buffers.	Weight of Vehicles.	Load Estimated.	Total Weight Estimated.
							Ft. in.	Tons. cwt. qrs.	Tons. cwt. qrs.	Tons. cwt. qrs.
478	Engine -	6	–	–	–	–	—	30 0 0	—	30 0 0
	Tender -	6	–	–	–	–	47 0	22 10 0	—	22 10 0
386	Engine -	6	–	–	–	–	—	30 0 0	—	30 0 0
	Tender -	6	–	–	–	–	47 0	22 10 0	—	22 10 0
							94 0	105 0 0	—	105 0 0
845	3rd class -	4	–	–	4	–	28 6	6 0 0	2 0 0	8 0 0
351	Van - -	4	–	–	–	3	29 0	7 12 0	3 0 0	10 12 0
446	Tri-composite	6	1	1	2	1	32 0	10 0 0	2 9 0	12 9 0
634	3rd class -	6	–	–	5	–	32 0	9 12 0	2 10 0	12 2 0
555	Do. -	6	–	–	5	–	32 0	9 12 0	2 10 0	12 2 0
188	Composite -	6	2	2	–	1	32 6	10 5 0	2 3 0	12 8 0
497	1st Class -	6	4	–	–	–	33 0	9 16 0	1 4 0	11 0 0
326	2nd class -	6	–	4	–	–	29 0	9 0 0	1 12 0	10 12 0
174	Van - -	4	–	–	–	2	25 0	7 0 0	3 0 0	10 0 0
618	1st class -	6	4	–	–	–	33 0	9 16 0	1 4 0	11 0 0
363	2nd class -	6	–	4	–	–	29 0	9 0 0	1 12 0	10 12 0
949	3rd class -	4	–	–	4	–	25 0	6 10 0	2 0 0	8 10 0
637	Do. - -	6	–	–	5	–	32 0	9 12 0	2 10 0	12 2 0
352	Van - -	4	–	–	–	3	29 0	7 12 0	3 0 0	10 12 0
639	3rd class -	6	–	–	5	–	32 0	9 12 0	2 10 0	12 2 0
	Total (carriages and vans) - -						448 0	130 19 0	33 4 0	164 3 0
	Total (including engines) - -						542 0	235 19 0	33 4 0	269 3 0

The estimate of Load is obtained as follows:—

One 1st class compartment.	Load estimated at	6 cwts.
One 2nd „	„	8 „
One 3rd „	„	10 „
One luggage compt. of carr.	„	15 „
One van	„	60 „

APPENDIX No. 18.

Great Western Railway.

List of Tyres which have broken and been thrown off the Wheel.

Engine, Tender, or Vehicle.			Diameter of Wheels.	L., D., or T. (if Locomotive).	Material.	Maker.	Date put on.	Where failed, at or near	Date failed.	Life of Tyre in Months.	Remarks.	Particulars of Breakage.
Number or Name.	Description.	Gauge.	′ ″									
Theseus -	Engine - -	B.	5 0	D.	Bess. steel -	Cammell -	19/7/67	Leamington -	1/5/68	9⅓	Gibson's fastening	Flange holding key broke, causing tyre to be thrown while running.
217 - -	2nd class - -	„	4 0	—	Do. - -	J. Brown & Co.	23/2/69	Loughor - -	10/5/69	2½	Do. - -	Broke into 12 or 14 pieces.
Amazon -	Engine - -	„	8 0	—	Do. - -	Cammel - -	16/7/67	Goring - -	28/6/69	23½	Do. - -	Broke into several pieces. R. H. Dr. tyre thrown. One piece broke trailing wheel, and one piece broke leading wheel of first carriage.
195 - -	2nd class - -	„	4 0	—	Do. - -	Do. - -	12/4/69	Ferryside -	2/7/69	2½	Do. - -	Broke into four pieces.
—	Carriage - -	„	4 0	—	Do. - -	Do. - -	6/5/68	Paddington -	24/9/69	16½	Do. - -	Broke into three pieces.
212 - -	Composite -	„	4 0	—	Do. - -	Do. - -	3/12/68	Langley - -	(about) 11/69	11	Do. - -	Broke into three pieces.
—	Carriage - -	„	4 0	—	Do. - -	Do. - -	21/7/69	Reading -	2/2/70	6½	Do. - -	Broke and flew off wheels.
75 - -	Tender - -	N.	3 6	—	Do. - -	Butcher -	18/8/69	Swan Village -	17/2/70	6	Do. - -	Broke into five pieces.
201 - -	Engine - -	„	3 6	—	Steel - -	Vickers - -	—	Stratford -	31/12/70	—	Do. - -	Broke into four pieces.
630 - -	Wagon - -	B.	3 6	—	—	—	—	Pencoed - -	30/1/71	—	Do. - -	Broke into three pieces.
95 - -	Engine - -	N.	4 0	—	Bess. steel -	Cammell - -	3/9/68	B'head Docks -	3/4/71	31	Do. - -	Large piece broke off wheel.
Emperor -	Do. - -	B.	8 0	D.	Do. - -	Do. - -	11.68	Hayes - -	24/10/71	35	Do. - -	Broke across tyre. One piece left wheel.
Creon - -	Do. - -	„	5 0	„	Do. - -	Do. - -	9/2/67	Grange Court -	22/2/72	60½	Do. - -	Broke into seven pieces.
284 - -	P. B. van -	N.	3 6	—	Homo. iron -	Patent Shaft -	—	Upton Magna -	1/5/73	—	Do. - -	Broke into five pieces.

APPENDIX No. 14.

GREAT WESTERN RAILWAY.—CARRIAGE DEPARTMENT.

STATEMENT of Carriage and Wagon Stock taken from other Railway Companies and added to Great Western Railway Stock since 1862.

Transferred from	Passenger Stock.								Total Waggon Stock.
	1st Class.	Compos.	2nd Class.	3rd Class.	Vans.	Horse Boxes.	Carriage Trucks.	Total.	
NARROW GAUGE.									
West Midland Railway - -	35	65	43	75	40	33	14	305	4,064
Shrewsbury and Hereford Railway -	4	3	4	4	4	3	4	26	148
Vale of Neath Railway - - -	—	—	—	—	—	—	—	—	3
Clee Hill Company - - -	—	—	—	—	—	—	—	—	17
Lynvi and Ogmore Railway - -	—	5	—	8	2	—	—	15	923
Llanelly Railway and Dock Company	—	9	—	19	1	2	—	31	794
Total Narrow Gauge -	39	82	47	106	47	38	18	377	5,949
BROAD GAUGE.									
Vale of Neath Railway - -	1	6	4	17	2	—	—	30	829

APPENDIX No. 15.

EXTRACT from the Rules and Regulations of the Manchester, Sheffield, and Lincolnshire Railway.

Part of train detached when in motion.

If any part of a passenger or goods train should become detached when in motion, care must be taken not to stop the train in front before the detached part has either stopped or come gently up. The guard must also apply the break in time to prevent a collision with the carriages in front, in the event of their stopping. There may be cases requiring the train to stop, whether from a signal or from the personal observation of the engineman or guard, when the most prompt judgment and skill may be required to decide whether to stop quickly or merely shut off the steam and let the train stop of itself. If anything is wrong with the engine, requiring it to stop, the quicker it can be done the better; but if any of the intermediate parts of the train be off the rails, the allowing the carriages to stop of themselves has in some cases kept up a disabled carriage, when it is probable, if the front breaks had been applied, the carriages behind would have forced themselves over the disabled one. If the disabled carriage or wagon should be the last or nearly the last in the train, the breaks in front may be applied with advantage; but if towards the middle or front of the train, it is generally better to allow the carriages to stop of themselves, as by keeping up a gentle pull the disabled carriage may be kept more out of the way of those behind, until the force of the latter is gradually exhausted.

Engine out of order.

Carriages or wagons off the rails.

Disabled carriage or wagon.

In all cases the application of breaks behind a disabled carriage will be attended with the greatest advantage and safety.

Three distinct whistles must be given as a signal for all the breaks to be instantly applied; and the continually repeated quick sound of the whistle must be given in cases of danger.

Signal to apply breaks.

APPENDIX No. 16.

GREAT WESTERN RAILWAY.

"1 *pair carriage wheels*, 3′ 6″ *diameter*, *axle* 16,582."

We have no record of this axle previous to 1870, the information recorded being as follows :—

Came in, Nov. 27, 1870. Went out, Dec. 23, 1870.	Worcester shops.	Under 3rd-class carriage 217.
Came in, June 23, 1871. Went out, July 8, 1871.	"	"
Came in, June 6, 1872. Went out, June 15, 1872.	"	"
Came in, Sept. 4, 1872. Went out, Sept. 16, 1872.	"	"
Came in, Oct. 27, 1873. Went out, Dec. 11, 1873.	Newport Works.	Taken out of 3rd-class carriage 217.
Came in, Oct. 17, 1873. Went out, Dec. 24, 1873.	"	Put under 3rd-class carriage 845.

The dates given are those on which the carriages enumerated came in shop for repair and left shop after repair.

APPENDIX No. 17.

GREAT WESTERN RAILWAY.

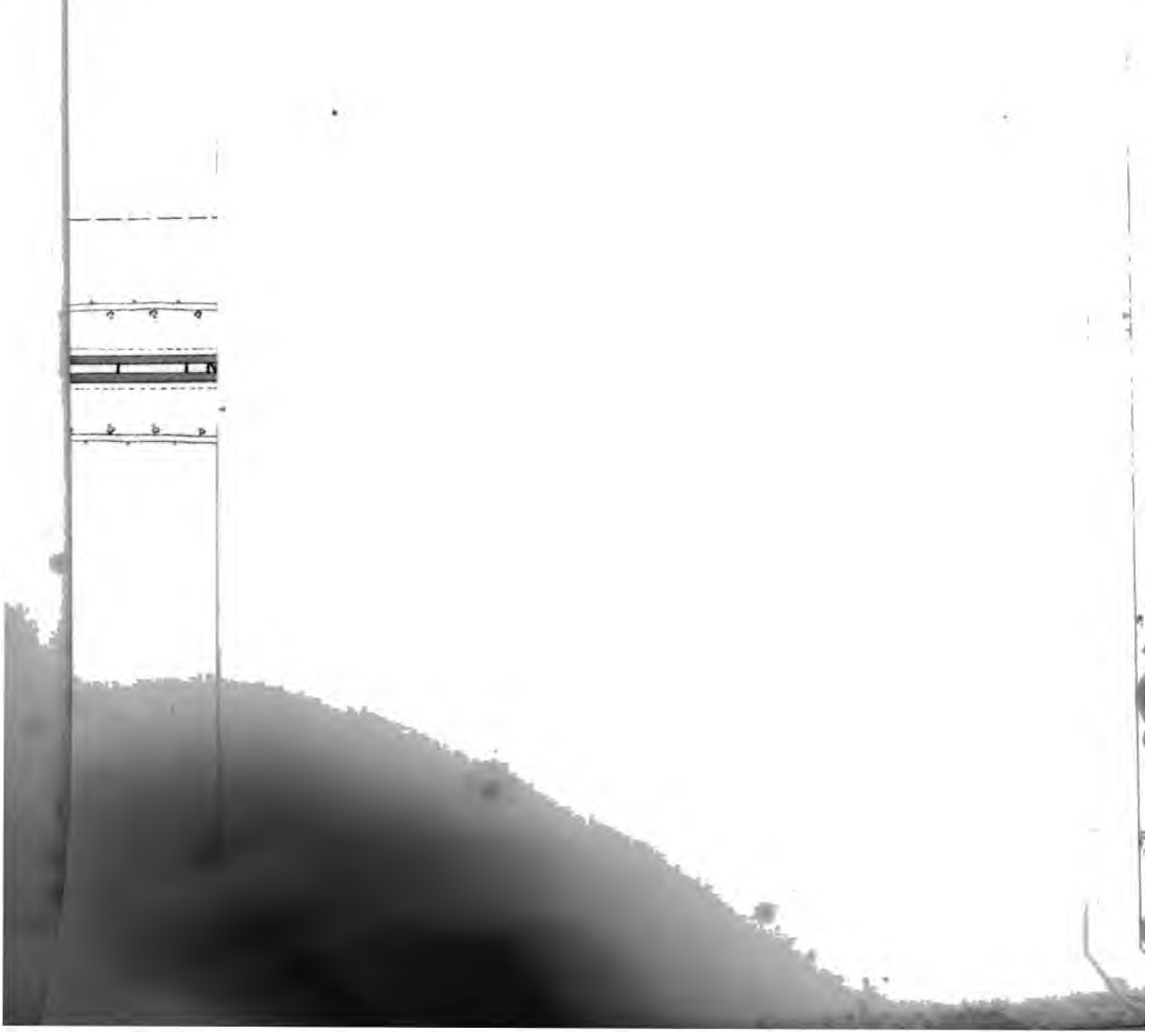
CARRIAGE AND WAGON STOCK, JANUARY 1861.

——	Passenger Carriages.	Luggage Vans.	Carriage-Wheels and Horse Boxes.	TOTAL PASSENGER STOCK.	Wagons and Goods Vans.	TOTAL CARRIAGE AND WAGON STOCK.
Broad Gauge - -	594	67	391	1,052	4,375	5,427
Narrow Gauge - -	213	34	73	320	3,728	4,048
Total - -	807	101	464	1,372	8,103	9,475

There is nothing in the Stock Books of this date (January 1861) to show the nature of the tyre fastenings.

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

T
RD.



To accompany Colonel Yollands Report
Dated 27th Feby. 1875.

Plate II.

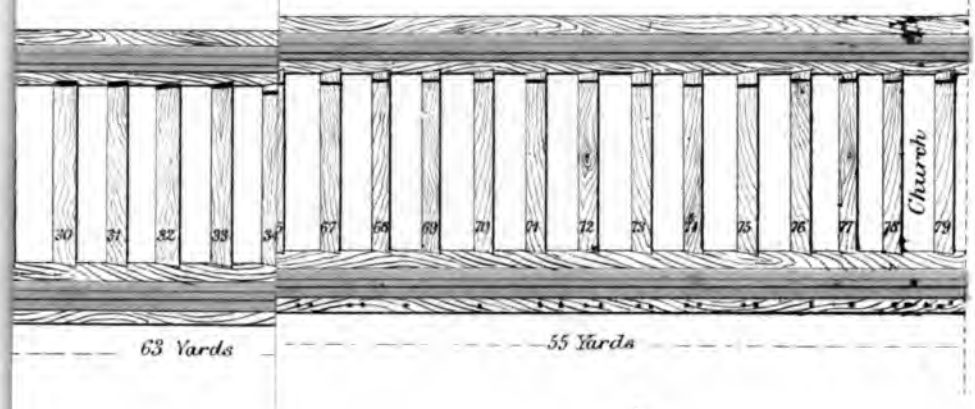
DOWI

VING THE MARKS

RAILWAY AC

Old Transom
New "
Marks on Long

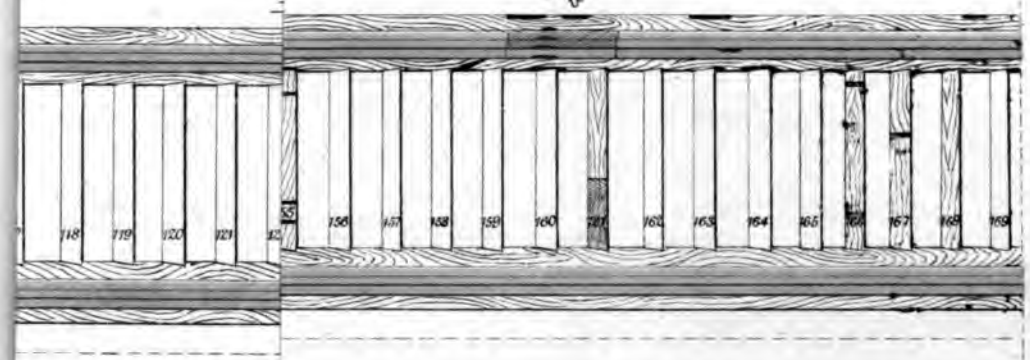
where large
ece of Tyre was found

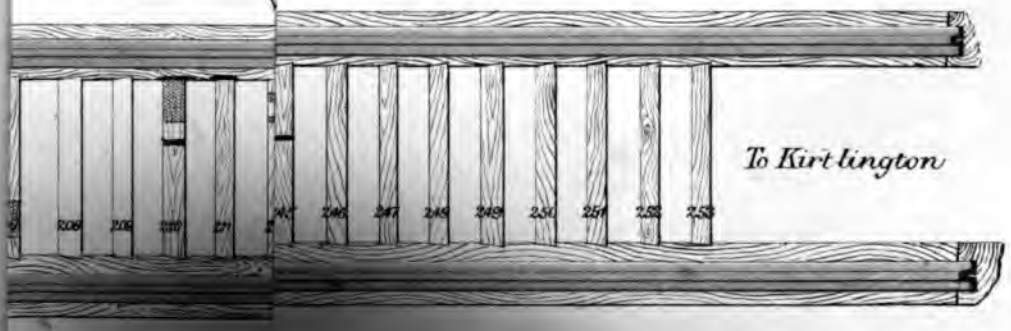


63 Yards

55 Yards

Damaged Rail taken out





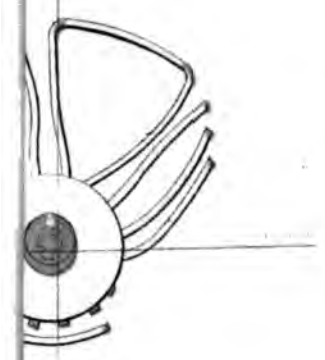
St. Covent Garden

To Accompany Colonel Yollands Report
Dated 27th February 1875.

Plate III.

3

EL.



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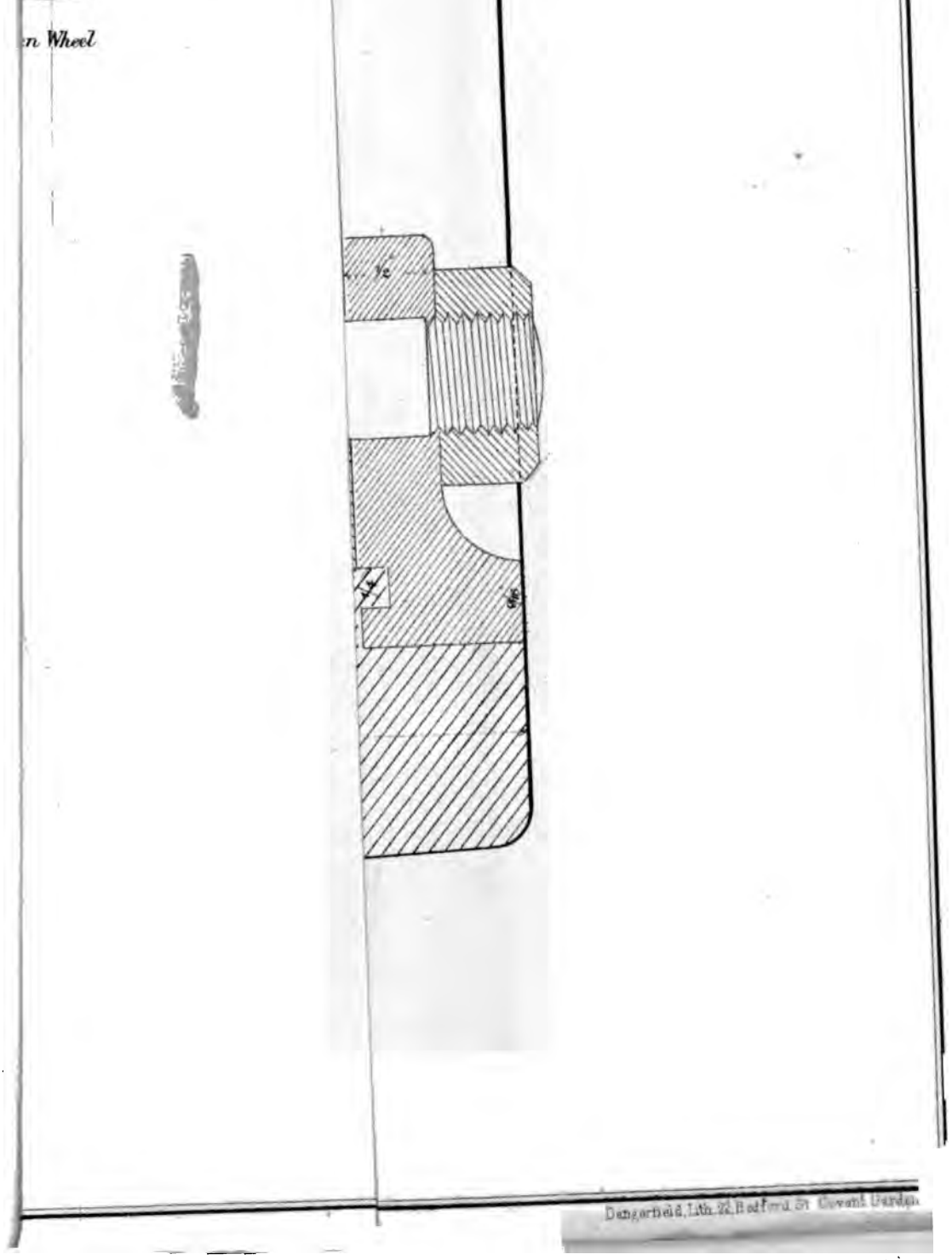

Dangerfield, Lith. 22, Bedford St. Covent Garden.


INCORPORATED

THE REPORT OF THE COURT OF INQUIRY

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE, DATED THE 22ND JANUARY 1876, INTO THE CIRCUMSTANCES ATTENDING THE

Double Collision on the Great Northern Railway which occurred at Abbotts Ripton on the 21st January 1876.

Board of Trade,
(Railway Department,)
Whitehall, 23d February 1876.

SIR,

IN compliance with the instructions contained in the Order of the 22d January, I have now the honour to report, for the information of the Board of Trade, the result of the public inquiry into the circumstances which attended the double collision that occurred on the 21st January, at Abbotts-Ripton, on the Great-Northern Railway.

This inquiry was held at Peterborough, under the Railways Regulation Act of 1871, 34 & 35 Vict. c. 78. ss. 7 and 8, with the assistance of Mr. C. S. L. Bowen, barrister-at-law, and extended from the 24th January to the 17th February, during which time four sittings were held, and 46 witnesses were examined. The Town-Hall and New-Courts-Hall were kindly placed at our disposal, and we are indebted to the courtesy of Mr. Gaches, the town-clerk of Peterborough.

In this case the Scotch-express passenger-train, due to leave Peterborough for London at 6.18 p.m., and consisting of an engine and tender and 10 vehicles, came into collision, whilst approaching the Abbotts-Ripton signal-cabin at full speed, and with the steam still on, with a coal-train due to leave Peterborough in front of it at 5.35 p.m., which, having left Peterborough at 5.53, was being shunted out of its way into the Abbotts-Ripton siding. The down-main-line having become obstructed by the *débris* from this first collision, the Leeds-and-York express passenger-train, 5.30 p.m. from London, after passing Huntingdon at 6.59 p.m., came into collision, first with the tender and afterwards with certain damaged carriages of the Scotch-express-train.

Thirteen passengers have unfortunately lost their lives in consequence of these collisions, and up to the present time 53 additional passengers have been ascertained to be more or less injured. The engine-driver, fireman, and head-guard of the Scotch-express-train, and the engine-driver and fireman and front-guard of the Leeds-express-train, were also injured.

The accompanying plan and section of the line, which Mr. Johnson, the engineer of the Railway Company, has been good enough to furnish, will give an excellent idea, not only of the positions of the stations and cabins principally referred to, with their signals, and the gradients on which they are situated, but also of the results of the collisions; and a further description of the localities will be found in the evidence of Mr. Johnson, which with the other evidence was taken during the inquiry as follows:—

Evidence.

Richard Johnson (sworn). I am the Engineer of the Great Northern Railway, and have been so for 14½ years. The ruling gradient between Peterboro' and Huntingdon is 1 in 200. Commencing from Huntingdon there is first a gradient of 1 in 200 for three miles, then the line is level for three-quarters of a mile, and then for one mile south of Abbotts Ripton signal-station the line falls 1 in 200 towards the north as far as four miles beyond the signal-cabin. From the foot of that gradient the line is level for 4½ miles through Holme Fen; it then rises up to Yaxley signal station for a mile 1 in 200, and thence to Peterboro', 3½ miles, the line is nearly level. The Abbotts Ripton signal-cabin is at a point 63 miles 35 chains from London; the north distant-signal is 950 yards, and the south distant-signal 1,057 yards from the cabin; the north home-signal is 140 yards and the south home-signal 145 yards, from the cabin. (There are also starting-signals in each direction, the starting-signal at one end being in each case on the post applying to the home-signal at the other end.) They are semaphore-signals of the ordinary construction. At Abbotts Ripton signal-station there are up and down shunting-sidings, and the points leading to and from those sidings are worked by a signalman by means of levers in his cabin. Those point-levers are interlocked with the signal-levers. The levers are so interlocked that the points cannot be opened to communicate between the siding and the main-line unless the signals are at "danger." There is a cross-over road between the two main-lines opposite to the cabin, the points of which are similarly interlocked

with the signals. (There are also block-telegraph-instruments for each direction, and a double-needle speaking-instrument.) On the north of Abbotts Ripton there is a cabin called Wood Walton, at a distance of 1 mile 1,375 yards; it is provided with up and down distant-signals, 950 yards from the cabin in each direction, and with a double home-signal, which acts for both lines, 20 yards north of the cabin. The Conington signal-cabin is 2 miles 132 yards north of Wood Walton, at the foot of the above 1 in 200 gradient. It is similar to the Wood Walton cabin as regards the signal arrangements, and they are both provided with telegraph-block-instruments and bells. At the Holme station, 1 mile 1,667 yards on the north of the Conington cabin, there is a signal-cabin with a locking-frame of 30 levers, and the whole of the points and signals in the neighbourhood of Holme station are worked from this cabin. With the exception of the signals on the north of the Holme signal-cabin, which can only be seen when the man opens the window and puts his head out for the purpose, they are all visible from the cabin in clear weather. The next signal-cabin south of Abbotts Ripton is Stukeley, 2 miles 737 yards from it. There are home and distant-signals in both directions. The up distant-signal is 910 yards from the cabin, and the down distant-signal 850 yards from it. The home-signal post is 27 yards south of the signal-cabin. These signals are visible from the cabin in both directions. There are block-telegraph-instruments and bells in this cabin similar to those in the Wood Walton and Conington signal-cabins. Last Friday evening, the 21st of January, I left Peterboro' about half-past eight, and reached the scene of the collision at Abbotts Ripton about 11 o'clock. We were much delayed by the signals being against us at Holme. I found a coal-train partly shunted in the up shunting-siding, with 26 loaded coal-waggons in the siding, the 27th waggon having one pair of wheels off the road, the 28th waggon, second from the engine, being smashed to atoms, the 29th, a good deal smashed, the the 30th waggon with its trailing-axle very much bent, and the engine of the coal train had been taken away. The engine of the Scotch express was lying on its side, with its head towards London, on the west of the down-line; its tender appeared to have been lying on the down-line, and the down-train appeared to have run through it and cut it to pieces. The engine of the down-train lay on the down side of the line, on its near side, with its tender lying partly above and on the south of it. The carriages of the down-train were much off the line, and one North-Eastern third-class carriage was on the top of a Great Northern six-wheeled break-van belonging to the down-train. The break-van and the two first carriages of the up-train were off the line, but not much injured; but the third and fourth carriages from the break-van of the up-train were very much injured, and were lying under the break-van of the down-train. From what I could see, the engine of the down-train had run quite through those carriages; it was there that the greatest loss of life and injury had resulted. Soon after I reached the scene of the accident, I met Mr. Cockshott, the traffic-superintendent of the Great Northern Railway, who had come down from London on hearing of the accident. I also found Mr. Rouse, locomotive superintendent at Peterboro', and Mr. Warr, the locomotive foreman from Hitchin, had arrived, and had commenced to remove the carriages so as to extricate the sufferers. I went up into the signal-cabin with Mr. Cockshott, and we saw the signalman who was on duty. I saw that the lever for admitting the coal-train into the siding was over in the forward position, and the levers for working the home and distant-signals were locked fast in the position of "danger." I tried the home and distant-signal levers, and they were all locked. I asked the signalman to move the siding points; they were, however, immoveable, owing, I believe, to the coal-trucks and carriages having fallen on to the connecting rods and wires. I did not notice the signals themselves, nor did I notice the positions of the telegraph-instruments. I then devoted myself to assisting the sufferers and clearing the line.

Francis P. Cockshott (sworn). I am Superintendent of the Great Northern Railway, and have been so for 11 years. This, as well as the whole of the main line of the Great Northern Railway, is worked under the absolute block, and under regulations which I now put in. I put in also the working time tables, containing regulations as to the loads and break power to be provided. I also put in instructions for signalling the fast trains by electric telegraph; also special regulations for working during fogs and snowstorms. With reference to the block working, the coal train, as well as other trains, is telegraphed from block-cabin to block-cabin; and after its departure from the first block-cabin, no other train should be allowed to follow on the same line of rails until it has reached the next block-cabin ahead, and telegraphic information to that effect has been transmitted back to the block-cabin in the rear. This system of working is in force for all trains, whether passenger, goods, mineral, or otherwise. The coal train leaving Wood Walton and reaching Abbotts Ripton would be protected by block working until it was on the south side of the home-signal at Abbotts Ripton, and was under the protection of that signal. In addition to the general mode of working, during foggy or snowy weather line-clear must not be given until a train or engine stopping at a station has either proceeded on its journey or been shunted into a siding; but in weather neither foggy nor snowy, line clear might be given to Wood Walton, so long as the train was covered by the home-signal, and while, therefore, it was being shunted into the siding. Also, under regulations, Holme station is required to telegraph to the signalman at Abbotts Ripton the passing of any up goods or mineral train, the object being that the signalman at Abbotts Ripton may know whether it is necessary to shunt any slower train to admit of its being passed by a faster train. The distance from the up home-signal at Abbotts Ripton to the points of the up shunting-siding is 100 yards, and the fouling point would therefore be about 68 yards south of the home-signal. It would have been the duty of the signalman at Abbotts Ripton to abstain from giving line clear to Wood Walton until the coal train was shunted into the siding, and clear of the main line. If that duty had been properly done, the coal train while shunting ought to have been protected by the home and distant signals at Wood Walton, as well as the home and distant signals at Abbotts Ripton. After hearing of the accident at 8.10, I left London at 8.30 p.m. by the Scotch express train, and reached Huntingdon about 9.45. I ascertained there that the passengers who were injured had already been removed from Abbotts Ripton, and that others who were able to continue their journey were at that time being placed in special trains to leave Abbotts Ripton in each direction. Having ascertained further that both lines were so much blocked at Abbotts Ripton that it was unlikely any train could be run through for several hours, I had an engine and carriages got ready at Huntingdon to take on from that station to London any passengers who had come down by the 8.30 express, and who might wish to return, as well as any passengers who had been in the trains which had come into collision. About 20 minutes later an engine came with a number of carriages from Abbotts Ripton bringing passengers who were uninjured, and others who were able and who wished to travel to London. I also sent a message to the hotels in Huntingdon to see if any who had arrived there by road or otherwise were wishful to go south. About half-past 10 a train came from Abbotts Ripton; other carriages were attached, and it was then sent on to London. As soon as I saw it ready to start, I took an engine, and went to Abbotts Ripton, and arrived there a few minutes before 11. I first looked round to see to what extent the lines were blocked, and what chances there were of either

being opened soon for traffic, and inquired of those already on the spot whether there was reason to believe that any who were passengers in the train were still under the wrecked carriages. About that time I met Mr. Johnson, who has given evidence; we looked very carefully at the spot where it was evident that at least two carriages had been broken up in the collision. We were told that very soon after the collision took place three bodies had been removed, and we felt, each remarking to the other, that there must be other passengers there. We had at that time closed the line against traffic; and the large staff of men who had arrived from Peterboro', Hitchin, and elsewhere, and who had already removed several broken vehicles, were concentrated on that spot. After that, Mr. Johnson and I went together to the signal-box, and found the locking-frame in the state described by Mr. Johnson. The only statement made by Mr. Johnson which is not quite correct is as to the number of the waggons in the coal train. There were 33 in all, and either two or three which were uninjured had by my instructions been moved south of the signal-box, and, in the darkness, these would not be observed by Mr. Johnson. Except as to that, the evidence I heard given is correct. Seven more passengers were taken from under the carriages, and this prevented me from examining the state of the signals. The night of Friday, the 21st January, was one of the wildest I have known, with sleet and snow and frost, and I believe the snow to have been at least four inches deep at the time.

Joseph Bray (sworn). I am an engine-driver in the service of the Great Northern Railway Company, and have been so for seven or eight years. I left New England on the 21st January at 5.53 p.m. with an engine and tender, 33 wagons of coal, and a break-van. I was due to leave at 5.35. My engine was a little late out of the shed after washing out, and I was also turned the wrong way in starting in the first instance, and was so late in getting away. I ran at my usual speed from New England to Peterboro', and so on to Abbotts Ripton. I found the signals all showing white lights up to and including the distant-signal from Abbotts Ripton. I did not see the home-signal from Abbotts Ripton, owing, I suppose, to the snow and smoke in the cutting. It was snowing very hard as I reached Abbotts Ripton. I expected that my train would be shunted at Abbotts Ripton for the expresses to pass, so I looked out for the signal cabin. I saw the signalman waving me on with his hand-lamp, and he gave me to understand that I was to shunt into the siding. I said to him, "What is it, Bobby?" and he said, "Siding." Whilst I was sitting back into the siding he said to me, "Come on back; look sharp; you are stopping the express." As soon as he had said those words the express ran into me. The express-engine struck the fourth, fifth, or sixth wagon from the engine; my engine was knocked forward, and the injector stopped working. I did not recover myself for five or six minutes, but I remained all that time on the engine, and then Mr. Usher, a relief-clerk in the traffic department, came to my engine and said, "Let us be off to Huntingdon to get assistance!" I told him to go to the signalman to ask permission; he went, and returned and said, "All right for us to go;" and then a gentleman and the coal-train guard got on the engine to go to Huntingdon, and the guard stood on the off-side of the engine with his hand-lamp ready to show a red light to any train coming in the opposite direction. I had previously sent my fireman with two fog-signals towards Huntingdon. We proceeded towards Huntingdon. I heard my fireman shout out, and we picked him up; that was somewhere between the bridge over the line and the distant-signal from Abbotts Ripton (about 500 yards from Abbotts Ripton). We had started again when I saw the down express
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iver of the down
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anybody
else saw me in that train. We had not then reached the distant-signal. We then went to Huntingdon. I saw a red-light at the advanced signal at Abbotts Ripton, which was the only red light that I saw on a signal-post between Peterboro' and Huntingdon. I believe I reached Abbotts Ripton at 6.47 p.m. The weather was very bad when I left New England. I had no orders for shunting at Holme. If the Scotch train had been punctual the signalman at Holme would have shunted me there, as I was 18 minutes late. I noticed that the Holme signals showed white lights at the home, distant, and starting posts. I sent my fireman away with fog-signals before Mr. Usher came to my engine; and as soon as I had recovered myself after the shock of the first collision, I asked him, when I picked him up, whether he had put down the fog-signals, and he said "Yes." I saw the driver of the down-express shut off his steam, and I thought he did so in answer to my alarm.

Edward Faulkner (sworn). I am a fireman in the Great Northern Company's service, and have been so for five years. I left New England on the 21st January, with Bray as engine-driver. I did not notice the time of starting or of reaching Abbotts Ripton. I saw a white light at the Holme distant-signal in passing. I saw white signals at all the posts at Conington and at Wood Walton. The distant-signal from Abbotts Ripton showed a white light; I did not look for the home-signal there. Bray called to the signalman to ask whether the signals were off, and the signalman said, "Draw up and shunt." We drew up to the starting-signal, which showed a little speck of red light when we got up to it. The glass was covered with snow. The signalman came to the window, and said to Bray and me, "Come on back, you are stopping the train at the other box;" and as soon as he had said the words the express pitched into us directly. The engine was knocked forward a few yards, and I remained on it. I recovered myself in three or four minutes, and then went to the tender-box, and took out two fog-signals, and went on with them towards Huntingdon at the request of my driver. I ran forward to the distant-signal, and put down the two fog-signals about 50 yards inside of it, and returned to meet my engine which I saw coming towards me. I got on the engine, and we had just got into motion again, when I saw the express coming and pass over the fog-signals I had put down. I did not hear them explode, but I saw fire from them as the engine passed over them. I saw the driver of the express shut off steam just before he passed our engine. I don't know exactly where our engine was on the line at that time. The signals all the way to Huntingdon, except the home-signal near the bridge at Huntingdon, were off.

William Hunt (sworn). I am a goods-guard in the Great Northern Company's service, and will have been so for six years next July. I left New England at 5.53 p.m., and reached Abbotts Ripton at 6.40. My watch was not two minutes out that day, I am certain. I heard the signalman there order us to shunt, and saw the points opened for us to do so, and saw a man examining them to see they were clear of snow, and in proper order for us to pass back through them. I rode back in my break-van at the rear of the train, and whilst doing so I heard a train coming. I thought at first it was a down train, but on looking out of the van I saw the up Scotch train pass at full speed with its steam on, and immediately afterwards the engine of that train struck the fourth or fifth waggon from my engine. I took up some fog-signals, jumped out of my van, and met Charles Day, the passenger guard of the Scotch train. My idea was to protect the wreck from the direction of Peterboro', but finding Day was going towards Peterboro', I went towards the wreck. There I met a gentleman, who offered assistance, and I went to the signal-cabin to see if both lines were blocked. I understood from the signalman that they were blocked, and that he was trying to attract attention to telegraph an account of

the accident. I went to my driver (Bray), and said to him, "We had better go to Huntingdon for medical and other assistance." We proceeded forward with permission from the signalman, and picked up the fireman. I stood on the off side of the engine, and showed a red light to warn a driver of any coming train. After passing under the bridge over the line, and before we got to the distant-signal, I saw a train which was then the other side of the distant-signal. I said to the driver, "For God's sake, Joe, blow up, for here's a train coming up." He did so, while I hallooed and showed a red light. I think we were seen and heard, for I saw the driver had shut off steam, and the speed of his train was reduced. We afterwards stopped the Manchester goods train near the Huntingdon prison. I told the engine-driver of that train not to go forward. Between Peterboro' and Abbotts Ripton cabin all the signals showed a white light, but I did not see the home nor the advance signal at Abbotts Ripton. At Stukeley the signals were off. We saw a red light in approaching Huntingdon, which turned out to be on a break-van in a siding there. At four o'clock in the afternoon it began to snow heavily at Peterboro', and the flakes grew bigger, as big as a two-shilling piece, and they seemed to stick to everything they touched. When leaving the signal-box at Abbotts Ripton, I heard that some one had been sent to protect the down road. The express was just at the distant-signal when the driver of the coal train gave the alarm whistle.

Charles Day (sworn). I am a guard in the Great Northern Company's service, and will have been so 14 years next Whit Monday. I was the under-guard with the Scotch train leaving York at 3.45 p.m. on the 21st instant. I was not booking the time, but I know we left Peterboro' at 6.24, six minutes late. My train consisted of an engine and tender, a break-van, two composite, a second-class, four first-class, then a second-class carriages, and my break-van. The snow was falling very fast after we left Peterboro', and I could see no signals. I was not aware of anything being wrong until I was thrown down in the van. I was hurt in the head and shoulder, and have not yet been able to go to work again. I got up, and relighted my hand-lamp, and put my fog-signals under my left arm, which was somewhat disabled; and after turning on the red glass took my hand-lamp in my right hand, and proceeded towards Peterboro.' I met the coal-guard, who said, "You ran into us full steam on." When I got past the distant-signal from Abbotts Ripton, I saw it was showing a white light. I did not see the home-signal at that time. I put fog-signals on the rails, and stopped the Manchester and Leeds express due from Peterboro' at 6.28 p.m. The guard of that train then went back towards Peterboro,' and I returned to the wreck. I found the home-signal at Abbotts Ripton showing a white light, and the distant-signal continued to show a white light. I did not tell the signalman that his signals were showing white lights. I got into my van, and felt ill, I imagine for half an hour. I did not go into the signal-cabin at all. I felt no checking of the speed whatever until the collision occurred. I had my pencil in one hand, and the way bill in the other.

William Wilson (sworn). I am an engine-driver in the Great Northern Company's service, and have been so nearly five years. I left London at 5.30 p.m. with an express train for Peterboro'. I stopped in due course at Finsbury Park, and was not due to stop again until I reached Peterboro'. The wind was blowing strongly from the north-east all the way down, and it began to snow between Tempsford and St. Neots. I found nothing but white lights on the signal posts right through, up to the time of the collision. I found a white light at the distant-signal at Abbotts Ripton. After passing that signal-post, I was alarmed by passing over two fog-signals which exploded; I at once shut off steam, and told my mate to put on the tender break. I was then going at 40 or 50 miles an hour. In another instant I met an engine on the up road giving sharp whistles, and I saw a red lamp from it, which I took to mean that there was something out of the usual way. I reversed my engine, and reapplied my steam, and as soon as that was done the collision occurred. I did not see the home-signal from Abbotts Ripton. I cannot say whether I was thrown on the bank or on the line; I found myself against the ruins of the break. When I had regained my strength I looked to my fire, and then attended to the fire of the up Scotch express, as the driver told me he could not do it himself, nor his fireman. I then assisted the passengers. I did not say anything to the signalman, nor go to the signal-cabin. I remained until my superintendent, Mr. Rouse arrived, who gave me leave to go home. I was not much hurt except the scald on my leg, but I have not recovered my nerve. It was 6.50 when I passed through Huntingdon. I whistled for the breaks when I passed over the fog-signals. When the fog-signals exploded about 60 yards on the north of the Abbotts Ripton distant-signal, I was travelling at a speed of about 40 or 50 miles an hour. I had an engine with eight wheels under it, and a bogie truck under its leading end (36 tons engine, 25 tons tender). I had a tender-break and a means of reversing in the ordinary way. I did my best to pull up after passing over the fog-signals, and I think I had reduced my speed to 15 miles an hour before the collision occurred. The engine in all respects and the tender-break were in good order. Supposing the distance to have been about 1,000 yards from the point where the fog-signals exploded under my engine to the point at which my train came into collision with the other train, I was not able to do more in that distance than reduce my speed to 15 miles an hour. The rails were in a very greasy state. As I approached the distant-signal worked from Abbotts Ripton, I could see it well for about 500 yards. It showed a distinct white light. The snow would be blowing against the back of that signal-lamp. I did not hear the whistle of the coal engine before I went over the fog-signals. I saw the red light and heard the whistle from the coal engine at the same time, a few seconds after passing over the fog-signals.

James Falkinder (sworn). I have been an occasional fireman in the service of the Great Northern Company since August 1868, and a regular fireman for over five years. I left London with the 5.30 p.m. Leeds express from King's Cross, stopped at Finsbury Park in the usual way, and noticed nothing out of the usual course until we approached Abbotts Ripton. I then saw the lamp of the distant-signal there showing a beautiful white light, and commenced firing. Getting near to the bridge over the line, and after passing the distant-signal, we ran over two fog-signals, which exploded under the engine. I at once applied the tender-break, pulled the sand-box open, and sanded the rails. The sand-box and the break were in good order. We were going at the usual full speed when we went over the fog-signals. As soon as we ran over the fog-signals my driver whistled for the breaks, and I held on to the tender-break. We were passing under the bridge when I heard the whistling from the coal-engine. I did not see a red light from that engine, I was on the left side of my engine. Everything was done, as far as I am aware, to check the speed of our train, and we were going about 15 or 20 miles an hour when the collision occurred. I recollect striking something, I did not know what. I did not know what became of me at the moment. I found myself crawling up the bank on the west side and behind the engine when I recovered. I found the hedge, and caught hold of a woman who was sitting there, and who I thought was my mate. I did not go to the signal-cabin, nor see anything of the signals. I have not yet resumed work, but I am getting well again. I heard no communication from the guard of our train, but I know the communication-cord was attached, and had been acting.

George Scott (sworn). I have been five years a fireman, and 11 years next July in the Company's service. I left Peterboro' at 6.25 p.m. with the Scotch express for London on the 21st January. Nothing unusual occurred up to Abbotts Ripton. The glass of the weather-board of my engine was covered with snow, and I opened it to see the home-signal at Wood Walton. That signal showed a white light. I could not see it further than 200 yards away. I did not notice the distant-signal at Wood Walton. I first caught sight of the distant-signal from Abbotts Ripton when I was about 200 yards from it, and I kept my eye on it until I was within a few yards of it. It showed a clear white light; the naked lamp was visible. After being certain that the signal was at all right I put coals on the fire. When I had regained the upright position after firing I saw some waggons close to the side of the engine. They were in the siding, and I thought they were coming out of it. I said to Catley (my driver), "Wo! here's some waggons!" and the collision occurred immediately. If the steam was shut off it must have been at the last moment; I did not see it shut off. I heard nothing from my driver after passing Holme signal-cabin until the collision occurred. We had no warning after leaving Peterboro' until the collision occurred. Although not able to see the distant-signal at Abbotts Ripton so far as usual I did not notice that the driver reduced his speed at all. In ordinary clear weather that distant-signal is visible in passing the Wood Walton cabin.

Robert Wills (sworn). I am a passenger-guard in the Great Northern Company's service, and have been so for five years. I left King's Cross at 5.30 p.m. on the 21st of this month with the York and Leeds express. An engine and tender, a six-wheeled break-van, a third-class, two composite carriages, a break-van, a bogie composite, a third-class, a carriage-van (a second-class break-carriage), a third-class, three six-wheeled composites, and a break-van,—these formed the train at the time of collision. We had also in leaving King's Cross four carriages which were slipped at Hatfield as usual. There were three break-vans to 13 carriages, and each break-vehicle of the three had a guard in it. We ran in the ordinary way and at the usual speed until we got inside the distant-signal from Abbotts Ripton. I did not see that signal, although I was looking out for the signals. The first thing I heard after passing that distant-signal was an alarm-whistle from the coal engine. I heard several sharp short whistles. I applied my break at once as tightly as possible, I was riding in the van next behind the tender. The next thing I heard was that we struck something; that is all I remember, because I was stunned. I should think we passed the distant-signal at 50 miles an hour, and from 30 to 40 when the collision occurred. I heard a break-whistle from my own engine after the whistling from the coal-engine. After the whistling of the coal-engine, and before the whistling of my own engine, I heard fog-signals explode. They seemed to be near that bridge, between the distant and the home-signals. I believe that I recovered myself about five minutes after the collision, and went back to see if my train was protected; and I came to the conclusion, from the fact that his lamp and signals were not there, that the rear-guard had gone back to protect the train. I then assisted the injured passengers as much as I could, but I was so badly injured myself that I could do little. After the accident I only noticed that the advance-signal at Abbotts Ripton cabin was at "all right." I did not notice that signal until after the collision. When travelling through fog or snow it is our practice to run very cautiously until the distant-signals are seen, when we conclude it is clear for us through the stations or past the cabins. On this occasion it was snowing very hard, large flakes; it was the roughest night I was ever out in, snowing, freezing, and blowing hard. On the night in question, the speed in approaching Abbotts Ripton distant-signal was reduced about 10 miles an hour. Ordinarily we should run at 60 miles an hour at the point, and on this occasion we might have approached the signal at 50 miles an hour. I saw nothing of the signalman after the collision. We were one minute late in leaving King's Cross and Finsbury Park, and slacked at St. Neots for relaying. I happened to look at my watch, and noticed we passed Huntingdon north box at 6.51, two minutes late. The collision occurred about five minutes to 7 o'clock. My van was smashed to atoms. I found myself in the ditch at the bottom of the cutting after the collision. I heard the communication with the driver tested at King's Cross. It was not half a minute between the explosion of the fog-signals and the whistling of the coal engine. I could not tell the difference between 50 and 60 miles an hour in my van. We were about two minutes late at Abbotts Ripton, not having lost any time between Huntingdon and Abbotts Ripton. We had not lost time, and could not therefore have reduced speed in approaching the Abbotts Ripton distant-signal.

Wilson recalled. We were running at the usual speed in approaching the Abbotts Ripton distant-signal. I had run that engine for a fortnight, and have been running fast trains between London and Peterboro' for two years on and off. I work my engine in all weathers so as to keep time. I was never out in a worse night than that of the 21st. It was freezing, blowing, and snowing. It was bad for seeing signals, and I have frequently known signals to stick on such nights. I was four minutes late at Abbotts Ripton. I judged that, because I had been four minutes late at Huntingdon. I tried all I could to keep time, but through stress of weather I lost a little. When a lad porter I was in the habit of lighting the signals, and have found them to have stuck in such weather as that of the 21st. I did that duty for about three years, and have very frequently known the signals to stick under such circumstances. It was at Claypole that I have known them to stick. I should think I have known them stick about three or four times. I can't say that I have known them stick at Grantham. As an engine-driver, I have observed the signals not working properly from frost or snow, but have never had occasion to report them. I was astonished to run into the train after finding the signals exhibiting white lights. I remarked on the night of the accident to guard Wills and my fireman that I found the signals all right, and I recorded the fact in a book for the purpose. I was not asked on that night by any one connected with the Company why I ran past the signals. I saw Mr. Rouse and Mr. Parks, the superintendent at New England. I also saw Company's officers from London, but they did not ask me about the signals.

Copy of letter by Wilson reporting the accident.

"Sir, January 22nd, 1876.

"I beg to report I was working No. 203 down passenger train on the 21st. On approaching Abbotts Ripton distant-signal it was at all right. After passing the distant-signal I passed over a fog-signal. I shut off steam, and whistled for the breaks. As soon as this was done, an engine on the up line passed me, giving me signals of distress. I reversed my engine, and instantly a collision occurred.

"I am, &c.

"W. Wilson, 48 engine."

Joseph Simpson (sworn). I am a passenger-guard in the Great Northern Company's service. I have been so for more than 20 years. I have the habit of running with fast trains about [illegible] left King's Cross as nearly as possible. I slipped carriages at Hatfield. My [illegible] the middle of the train. I [illegible] Northern break-carriage. [illegible] vehicle from the tender. I [illegible] St. Neots. I saw the sig[illegible]

then the snow got worse and worse, and blocked up the windows. After leaving Huntingdon the first thing I heard was, on approaching Abbotts Ripton, a whistle from a passing engine. The whistles were three in number, and very sharp. I am almost sure we had passed the distant-signal when I heard that whistle. I heard no fog-signals explode, nor any break-whistle from my own engine. I opened my side window, and looked out, but could see nothing. We seemed to run into them momentarily, and my head went through the glass of the top corner window of the raised part of the break-carriage. As soon as I heard the whistle of the coal-engine I applied my break. If it had not been for the whistle of the coal-engine I should have done nothing. I am almost certain we were a good distance inside the distant-signal when I heard the whistle and applied the break. I noticed after the accident that the signals were loaded with snow. I did not note the time when the collision occurred. My carriage did not appear to be damaged. I first re-lighted my lamp, which had been knocked out by the collision, and then ran across to the signalman, and asked him whether he had blocked both lines, as I had observed the carriages had blocked both lines. I went up into the signal-cabin. The signalman, in answer to my inquiry whether the lines were blocked by the signals, replied, "Yes;" and I noticed that two levers which he pointed out to me were thrown back. A good number of levers were thrown forward, but these were thrown back. I do not understand the working of signals. I told the signalman that my mate had gone to Huntingdon, and that I was going towards Peterboro' at once. No more passed, and I left, and went about half a mile towards Peterboro'. I found a train coming slowly which had been warned by somebody whose footprints I saw in the snow. I jumped on the step of the engine of this train, which was the Leeds and Manchester up express; and when we approached the distant-signal worked from the Abbotts Ripton signal-cabin, the driver said, "Joe, look at that signal; what do you call it, showing red or white?" I said, "Well, it shows white from here." We were then going very slow, and about a dozen yards from it. We could see that signal at 40 yards. It was snowing fast at that time. The spectacle-glass of the lamp was covered with snow. The red-glass was before the light, but the snow which covered the spectacle made it show a white light. The arm I noticed was up at "danger." I did not notice the home or advance-signal at Abbotts Ripton. The driver (Edis), on whose engine I was riding, said, "Go into the signal-cabin, and see if the "signalman has got his lever over, and tell him his "signal shows a white light." I went to the cabin, and said to the signalman, "Are you sure your signal is at danger, because it shows a white light?" He replied, "It must be the snow which is on it," and he also said he had just sent one of the men to look after the distant-signal. I then went down and assisted to light a fire for the passengers, and to deliver people from the wreck. When I went into the cabin the signalman was busy with his telegraph instruments. He said nothing as to how the accident happened. The communication in the train is only between the rear-guard and the driver, but an intermediate guard can pull the cord by putting his hand out. The signalman seemed to be clear when I spoke to him. When speaking to the driver, Edis, on his engine at the Abbotts Ripton signal, he said, "Joe, what light do you call that; it shows a white light?" When we got opposite the post he said, "It must be the snow in front of the glass spectacle."

John Robinson (sworn). I have been a passenger guard in the Great Northern Company's service for 10 years, and have run with fast trains for five years. I left King's Cross with the Leeds and York express about a minute late, and rode in the rear van of the main-line portion of the train. Some carriages were slipped at Hatfield, and then my break was the last vehicle of the train. I did not notice the time in passing through Huntingdon. Nothing unusual occurred until after leaving Stukeley. I saw the distant-signal at Abbotts Ripton, which showed a good white light, and then I heard an engine give three sharp whistles. It was coming in the opposite direction. I saw it pass, but could not tell what it was. I had passed the distant-signal 100 yards or more when I heard this engine whistle, and was getting near the bridge over the line. As soon as I heard the engine whistle I put my break tight on, and left it on till the collision occurred. I heard no whistle from my own engine, nor any fog-signals. We were going about 40 miles an hour in passing the Abbotts Ripton distant-signal, and had reduced it to 30 when the collision occurred. I was not much injured, but was stunned. I think I came to myself in about a minute and a half. After that I took my lamp and fog-signals, and went back to protect my train. I noticed the Abbotts Ripton distant-signal, but not the home-signal. The distant-signal still showed a white light. I had said nothing to the signalman before going back. I did not notice the arm of the Abbotts Ripton distant-signal. I put a man named George Wright at the distant-signal, and gave him three fog-signals. I told him to put the red spectacle over the white light. The arm and the spectacle move together, I know. I did not notice as I went back whether the platelayer had put the signal to red. I next went towards the Stukeley cabin, and noticed that its distant-signal showed a little white light, but more red. The home-signal was about the same. I went into the Stukeley cabin, and asked the signalman why he did not put up his signals properly, and he replied that he had done so. He worked the levers to show me that the signals were up. I did not notice the back lights of the signals. I asked him what time our train had passed the cabin, and I think he said 6.57. I also asked him what had gone up, and he said it was an engine, and had gone some time. I then asked him whether he had fog-signals on the line; and he said he had, both above and below the bridge. I asked him for a drink of tea, and some fog-signals, and I proceeded to Huntingdon. I met an engine with a goods-train, and rode on the engine to Stukeley. I asked the signalman if it was right for us to go, and he said we were to go on cautiously, which we did to the wreck. I rode on the side of the Bradford carriage on returning, and saw the Stukeley signals still at "danger." On my return at first to Abbotts Ripton I did not notice the distant-signal. I tested my communication-cord at King's Cross; it was perfect. I saw a red light from the coal-engine at the same time that I heard the whistle.

Albert Usher (sworn). I am a relief-clerk in the Great Northern Company's service, and have been so for 3 years, and 11 years in the service. My duties are to relieve station-masters, and to assist in the accounts at stations when they are behind with them. I left Peterboro' about 6.25 in the Scotch express on the 21st of this month. I noticed nothing until the collision occurred, being asleep on the seat of a second-class carriage into which I had got because all the first-class carriages were full. The carriage I rode in was the last carriage in the train, there being a van behind it. I was pitched off the seat without being hurt by the collision. I got out of the carriage on the near side, and went round the engines of the Scotch and coal trains running to the signal-cabin. I asked the signalman whether he had blocked the down line, meaning to ask whether he had turned his signals for that line to danger. He said "Yes." I got on a stool, took down fog-signals from a box, gave them to the Abbotts Ripton porter, and said to him, "Take these and put them on the down-line as fast as you can;" and he ran out immediately. I then ran out of the cabin down to the coal-engine, and saw a man in guard's uniform (I believe Hunt), and I said to him, "We must get to Huntingdon as quickly as ever we can;" and called out for some one to uncouple the engine. I went to look at the coupling, but before I could do so

I was told that the coupling was broken and the engine therefore released from the train. I then got on the engine, and found the driver was there, and said to him, "Now we must get to Huntingdon;" and he said to me, "Have you seen the signalman;" I said "It is all right with the signalman;" and almost directly we made a start. The engine had just moved when a gentleman from the ballast called out, and I think he said he wanted to come with us, and he came. My impression is that just before we got to the distant-signal we met the down express. I cannot say for certain whether that train had passed the distant-signal or not when we met it. Just before the express passed us I saw two flashes, and heard two slight reports, which I took to be the explosion of two fog-signals. As soon as we saw the express, the driver of the coal-engine blew several whistles; I am not sure whether that was before or after we heard the fog-signals. I saw guard Hunt waving his red light. We were whistling and shouting and waving the red light all at once, but I cannot say that we attracted any attention. The express passed us at a high speed. We went forward to Stukeley, where we stopped, and I went up into the signal-cabin, and told the signalman we were going on to Huntingdon for assistance. I left him immediately, and returned to the engine. I did not notice any of the down-signals, but I did notice some up-signals, two or three, which were showing half-red and half-white lights. I do not know exactly what signals they were. I cannot say whether it was before I got to Stukeley. I did not say anything to the signalman there about it. In returning from Huntingdon to Abbotts Ripton I was stopped by guard Robinson, and that was the first time I heard that the down express had run into the wreck of the first collision. We ran over several fog-signals on the way back to Ripton.

William Edis (sworn). I have been an engine-driver in the Great Northern Company's service between 14 and 15 years, and 11 years running fast trains. My practice in working trains is, when the weather is bad, to slacken speed, if I do not see the signals at the proper distance, until I do see them. This I always do in snow or fog, and I would rather lose time than infringe that practice. I started from London with No. 99 down train for Grantham, where I arrived at 12.44, and I left Grantham at 5.45 or 5.46. I next arrived at Peterboro' about 6.18 p.m., delivered up that train, and took another train, the Manchester express. I left Peterboro' at 6.39, 11 minutes late. I found all signals at all-right, until I reached Wood Walton. It was snowing hard at the time, and I could not see the distant-signal at more than 20 or 30 yards, or it might be 50 yards. The distant and home signals worked from the Wood Walton cabin were at all-right, and I shut off my steam on approaching the distant-signal until I saw it. I passed Wood Walton at a speed of about 40 miles an hour, and the signalman showed a red light by a hand-lamp from the window of his cabin. I then shut off steam, opened the sand-box, whistled for the guard's breaks, and reversed and brought my train to a stand near the down distant-signal of the Wood Walton cabin. I got off the engine there, and spoke to my rear guard, Bradley, telling him that the signalman had given me a red hand-light, although he had showed a white light on the signal. The guard then said that it was no use stopping there, as the Abbotts Ripton distant-signal was showing a perfect white light. We could see it from a distance of 300 or 500 yards. I whistled and started again, until I met guard Day, who had his red hand-lamp exhibited, and I stopped again. He gave me orders to draw up cautiously, which I did to within 20 or 30 yards of the rear of Scotch express train. I noticed the Abbotts Ripton home-signal, and it showed a perfect white light, and continued to do so until I left the spot about 9.40 to go back to Peterboro'. I went to the cabin, but it was full of passengers, and I did not speak to the signalman. I told a platelayer to put the up distant-signal at danger. I don't know the platelayer's name. He stood at the signal at the time. I told him to cut the wire, and shove it up to danger. I assisted the passengers, but did not examine the signals. I said to guard, Day, "Look Charlie, the signals are off now;" and he said "We had a collision, Bill, and a second one has occurred." I did not and could not see either the spectacle or the signal-arm of the distant-signal north of Abbotts Ripton. Coming to the home-signal I met guard Simpson between the home and distant-signals. He got on the step, and asked me if anybody had gone back to protect the train; to which I replied, "Yes, Charlie Day." I looked at the home-signal; it showed a perfect white light; and I called the attention of several to it. There did not appear to be any snow on the spectacle to obscure it. Simpson rode with me until I brought my engine to a stand nearly opposite the home-signal of Abbotts Ripton. The people whose attention I called to the state of the home-signal were guard Bradley, my fireman, Catley the driver of the Scotch express, and Simpson the guard. I said to guard Simpson that it must be the snow which was in front of the glass spectacle. He said so to me, or I might have said so to him; I can't recollect. I passed over a fog-signal near the Abbotts Ripton distant-signal. I went back on the wrong road to Holme, and looked at the signals on the way, and they all showed white lights. The snow was large, thick, and moist, tending to rest on an object on which it fell. It was at the distant-signal that I asked the platelayer to cut the wire. I observed the signal for 300 or 400 yards. I told guard Simpson to go into the signal-box at Abbotts Ripton, and tell the signalman that his signals were at all right, and to turn them to danger. I never had seen snow in such large pieces in my life before.

Reuben Murfitt (sworn). I am a fireman in the service of the Great Northern Company, and have been so for 4½ years. I accompanied Edis from Peterboro' by the 6.28 p.m.; I think we were a bit late. I noticed all the signals showed white lights until we reached Wood Walton cabin, where the signalman showed a red light from his hand-lamp out of his window. We ran past that cabin about 40 miles an hour. The steam had not been shut off until the red light was seen from the cabin at Wood Walton. The steam was not shut off on approaching Wood Walton distant-signal, because it showed a perfect white light. The engine came to a stand some distance past the cabin; I could not tell how far. My mate then got off the engine, and spoke to the guard, and they decided to proceed cautiously to Abbotts Ripton, which we did. We met guard Charles Day, with a red light, and stopped again. He told us what had happened, and then we drew up to Abbotts Ripton. I saw the distant-signal there, which showed a perfect white light. We then met a platelayer, and stopped to his red light, and did not meet any one else until we came to a standstill at the back of the Scotch express, and outside the home-signal. Lord Colville came on to the engine, and after him came guard Simpson. I observed that Edis and he were talking, but I did not hear what they said, because as soon as Simpson came up they both got down and spoke on the ballast. I noticed that the arm of the home-signal at Abbotts Ripton was loaded with snow, and it appeared to be half down and half up. I could see the arm distinctly. I could not see the lamp-glass or spectacle. It showed a perfect white light, not as if the snow were in the way to prevent its shining properly. I went back to Holme, and saw that the signals were showing perfect white lights. I do not think I have ever seen a lamp-glass covered with snow. I never saw anything like that snow before. I have been out in snowy weather, but never knew it make any difference in the signals before, but I have known the signals stick through the snow.

George Wright (sworn). I am an under platelayer in the service of the Great Northern Company, and have been so for 3½ years. I remember the 21st of this month; I was doing duty at the Abbotts Ripton

gate-house. John Hall, the foreman platelayer, called me out, and said there was a "pitch-in" at Abbotts Ripton. He wanted me to leave the gates, but I would not leave them, thinking it would be a neglect of duty. I laid two fog-signals on the down-line at the level crossing, and showed a red light from my hand-lamp. I did not and could not see anything of the Abbotts Ripton signals. A guard spoke to me, but I forget what he said. I then stopped a goods-train, which drew gently forward. Guard Robinson did not put me at the distant-signal, but he gave me three fog-signals, which another man took away from me, and went on with them towards Stukeley.

George Thomas Gregory (sworn). I am the station-master at Holme, and have been so for 12 years. I remember the 21st of this month, when the collision occurred. I was in the office when the coal-train passed my station, but I saw the Scotch express pass, without anything remarkable, at its usual speed. After the Scotch express passed I saw some platelayers, for whom I had sent, working the signals, and they then worked properly. The signalman came to me after the coal-train passed, and told me that that train had run past the signals. I went into the signal-cabin, and saw that the levers were over in the position of danger, and I then ran down and looked at the up starting-signal and the up home-signal, and found them at danger. But previously to going to them I sent a lad porter for the platelayers. I did not then look at any other signals. I watched the platelayers working the balance weights at the foot of the signal-post, and saw large quantities of snow fall off the arm. I noticed that the down home-signal, when it should have been at danger, stood at caution, the arm being half-up and half-down. I then told the platelayers to go to all the signals, and to work the balance weights so as to knock the snow off the arms. They did so. I saw it done at the home-signals, but I did not go to the distant-signals. I stood on the platform while the 5 p.m. express from King's Cross passed. I afterwards noticed that the down starting-signal did not go to danger, appearing as if the signal was not worked from the cabin. I went to the lampman, and told him to go and examine the lamp to see if it were properly wound up. He went, and said it was, and that the arm would not go up, to let the spectacle go up to cover the lamp, because of the snow. I went several times to the scene of the accident, but do not know at what time. I noticed the signals on the way to Abbotts Ripton. Conington distant-signal showed a white light, but the home-signal a red light, though you could not discern it until you got close to it, from snow, as I supposed, on the spectacle. The Wood Walton signals were in similar positions. I did not notice the Abbotts Ripton signals. The snow began to fall in the afternoon, and began to lie about 6 o'clock. When the Scotch express passed, I think it was freezing. I never saw such an accumulation of snow before on the spectacles and arms of the signals. I can't say that I have seen the signals fail to work because of snow, but I think I have. The signalman came to me as soon as he could after the coal-train passed, to say that train had run past the signals. I did not think it was necessary to have fog-signals laid to protect the coming up express. The signals were showing a dim red light when the coal-train passed. The signals had been put up against the coal-train to shunt it for the express. I sent Marriott to the up distant-signal to clear it. It was my duty, having received line clear from Conington not to stop the express. I knew they had had line clear after the coal-train from Conington. As soon as the signalman reported to me that the coal-train had run by his signals, I went to him, and he said, "There are my signals; they are all standing at danger." I asked him how he could account for it, and he told me he could not account for it in any way. I immediately ran down, and examined the up starting-signal, and found it showed a dim red light. I stood by while Marriott wiped the spectacle of the up starting-signal, and saw him do it, and I then instructed them to go and see that all the signals were working properly. Then I went again into the signal-cabin before the Scotch express passed, and saw the block instrument showing that the line was clear after the coal-train. I have no recollection of noticing that while I was in the signal-cabin the first time, but I am sure it was before the Scotch express passed that I went into the cabin the second time. It was 15 or 16 minutes after the coal-train that the Scotch express passed. I depended on the Conington and Wood Walton signals to stop the express while the coal-train was being shunted. I knew there was an irregularity in the coal-train passing the signals, but did not consider at the time that any further precautions were necessary.

John Collins Osborne (sworn). I am a signalman in the service of the Great Northern Company, and will have been a signalman at Holme station for 13 years next April. On the 21st instant, the coal-train, as shown in the record book, passed my cabin at 6.21 p.m. I gave train on line to Conington at 6.21, had it acknowledged from Conington at 6.21, and had it cleared from Conington at 6.25 in four minutes, which was its usual time of running. I made the entries in the book produced; the figures immediately after the train had passed, and the remark "Ran past signals," a few minutes afterwards. I at once called for Mr. Gregory, and he came immediately into the cabin, and I told him the coal-train had run past my signals, and asked him to go down and see if anything was the matter. He went down at once, and returned about 10 minutes or quarter of an hour afterwards. He told me that the starting arm on the post south of the cabin was up at danger, but that the home signal north of the box did not work properly. That, I believe, was before the Scotch express passed. I cannot tell whether he knew that I had received line clear for the coal-train. I think his first visit to the cabin was about the time that I received line clear for the coal-train. A down stopping-train afterwards arrived at the station at 6.25, and started at 6.26. My home and distant signals were off for that train to come into the station. The next train was a down express, which passed at 6.25, being cleared from Yaxley at 6.29. An empty coal-train passed at 6.47, and was cleared from Yaxley at 6.58. The up Scotch express passed me at 6.37, and my signals were at "All right" for it. I pulled the levers over. I had had no complaint about the signals, except what transpired about the coal-train. I had intended to shunt the coal-train, because I thought there was not time for it to go to Abbotts Ripton without delaying the express, and my intention was frustrated by its running past the signals. Having had line clear from Conington, I left the station-master to take what steps he thought fit. I received from Grantham, transmitted through Peterboro', notice of the Scotch express having passed Grantham at 5.46, which would make it 10 minutes late there. I told the station-master that the express was too near for the coal-train to go on to Abbotts Ripton, but we did not communicate with Peterboro' that the coal-train had run past to Abbotts Ripton. I felt that the coal-train might detain the express, but I was not anxious about the safety of the trains. The snow was very thick.

George Gammons (sworn). I am foreman platelayer at Holme, and have been so since last March. I was previously an under platelayer for upwards of 10 years. I was at Holme on the 21st of this month, when the collision occurred. I came out between six and seven, after having gone home after my day's work, to see how the weather was, and I found it snowing and raining very fast, but I don't think it was freezing. I then went in again. I saw an up-train, called the Manchester train, pass, I don't know at what time, and noticed that the up Holme distant-signal remained with a white light after that train had passed, when I thought it ought to have gone up to red. I watched an up stopping train which followed the Manchester express, and looked to see whether the distant-signal lamp was turned to red whilst it

was at the station, but the lamp continued to show a white light. I put on my clothes, and came out to the signal, and found that the arm was more off than on, instead of standing out at danger. The snow had settled on the arm, and weighted it down, which prevented it rising to danger. I took hold of the balance weight, and shook the snow off the arm by working it up and down. I walked back a little distance to see how the signal worked, and saw it exhibited a red light. I then went to the station, and met a man, and told him to remain at that signal till further orders. When I had cleared the snow off the arm it worked properly. I then went to the yard to attend to the points, and attended to that duty all night. I had found both home-signals also affected by the snow, and cleared them in a similar manner. I did not go to the other Holme distant-signal, as another man had gone there. We repeated the clearing three or four times during the night. I have known the snow to weight the arms of signals previously, but not so badly as at this time. It happened once before this winter. It was from my knowledge that snow might weight down the signal-arms, and from my previous experience in that respect, that I watched the signal as above described.

John Clark (sworn). I am a platelayer at Holme, in the service of the Great Northern Company, and have been so a little over 12 months. I live on the down side of the line about a quarter of a mile from Holme towards Huntingdon. I came out a little before seven, because I was suspicious of the weather, and thought I might be required. I met Mr. Gregory, and he told me to take my hand-lamp, and go out fogging. I went to the up-distant-signal from the Holme station, and stopped there all night. I shook the snow off the signal-arm by lifting the balance weight up and down. I saw the snow loading the arm, and had to clear the arm many times in the course of the night up to 12 o'clock, when the snow abated. I have never had to shake the snow off the signal-arms before, having never been out in the snow with signals before. I met Gammons on his way from the distant-signal, and I found on reaching it that the snow had accumulated on the arm, and the signal was showing a white light. I shook off the snow, and turned it to red again.

William Marriott (sworn). I am a platelayer in the service of the Great Northern Company, and had been so for three years last July. I was sent for by Mr. Gregory between six and seven o'clock on the 21st instant, and came up to the Holme station, and found the starting and home signals there were not in working order, because the snow had gathered on the arm and weighted it down. It kept the arm down at caution instead of allowing it to go to danger; and as the arm and glass worked together, so the glass was kept down, and showed part red and part white, instead of a wholly red light. I took hold of the balance-weight, and moved it up and down to shake off the snow. I went up the ladder once, and wiped the snow off the spectacle red glass; but I found it accumulated very quickly again, and knowing I could not keep it clear I used my hand-lamp instead. My work during the night was varied between the points and the signals, keeping them clear of snow. The white light was the brighter of the two when I first went to the home-signal; the lad that fetched me told me that a train had run past the signals, which showed white lights. It was snowing very fast when I went out.

Timothy Jakes (sworn). I am a signalman in the Great Northern Company's service, and have been so about six months, of which four months at Conington. I produce my record-book showing a coal train passed my cabin on the 21st instant. I received Be ready from Holme at 6.14; Train on line at 6.21. It passed my cabin at 6.25, and was cleared from Wood Walton at 6.32. My signals were off for it to pass, and [illegible] particular occurred in regard to it. I was [illegible] that it had run past the signals at Holme [illegible] intended to pass them. At 6.32 I [illegible]olme, Be ready for the express; Train on line 6.36. It passed my cabin at 6.38, and was cleared from Wood Walton at 6.41. I saw it pass at its usual speed. The first time I found any difficulty with my signals was when I tried to stop a slow passenger-train at 7.10. I stopped the train with a hand-lamp, because I had not got line clear from Wood Walton, when I heard it approaching at too great a speed. The engine-driver then asked me why I had stopped him with a hand-lamp when my signals were off. I told him that my levers were over in the proper place, and I supposed my signals to be at danger. When he informed me that the signals did not work I blocked the line back to Holme by five beats on my telegraph bell. I went outside my cabin to ascertain whether my signals were as the driver reported, and found that he was correct. I found a railway chair, broke it in two with a hammer, and fastened half of it to the balance weight of each home-signal. I had no means of doing anything to my distant-signals, and there was nobody whom I could send out to look after them. After that the road was blocked, and nothing was running.

Charles Rose (sworn). I have been signalman at Wood Walton in the Great Northern Company's service since last May. I produce my record-book, showing that a coal-train was signalled, Be ready from Conington at 6.20; Train on line at 6.24. It passed my cabin at 6.31, and was not cleared from Abbotts Ripton. At 6.35 I received from Conington Be ready for the Scotch express; at 6.37 Train on line for it. It passed me at 6.40, whilst line clear had not been received for the coal-train. My home and distant-signals were, as far as my levers were concerned, fixed at danger. I could not see how the signals were standing, for the snow which covered the windows of my cabin. I thought when the Scotch express passed that the coal-train would not be clear, because I expected it would be shunted at Abbotts Ripton. I did not show any hand-lamp to the express-train, because I believed my fixed signals to be at "danger." I did not hear the train approaching, on account of the wind, until it passed my cabin. Once in December my signals would not work on account of snow, but that was in the daytime. On the evening in question I came on duty at 6 p.m., after having been away for a week. There is no record of a train being stopped that evening at my cabin. If our signals go wrong we have no means of sending any one to correct them. I had told signal-fitter Pallinder of the signals not working properly. Referring to the regulations about fog-signalling I did nothing towards obeying the rule referred to. If I believed my signals were working properly I could not leave the box. I heard the Manchester express approach as if the signals were not obeyed, and I exhibited a hand-signal. I made a note in my book at 6.40, when the Scotch express passed, "Ran by signals," and I made the same note with regard to the Manchester express at 6.53. The Manchester express did stop, though it was outside my signals. A train slacked to my down-distant signal at 6.35, and the signal would, therefore, appear to have been working properly at that time. The last message I sent, or could send, to Abbotts Ripton was at 6.31.

Charles William Johnson (sworn). I am a signalman at Abbotts Ripton in the service of the Great Northern Company, and will have been so two years next March. I was previously at Wrenthorpe about three months as signalman. I produce my record book showing that I received the Be ready signal from Wood Walton for a coal train at 6.25 on the 21st instant, and Train on line at 6.32. It reached my cabin at 6.41, and I signalled, by waving my hand-lamp to the engine-driver, to shunt the train into the siding on the up-side. He drew forward clear of the siding points without any delay, and I at once gave him the signal to set back. He did so, and just as the engine was passing my cabin I called out to him, "Shove them back, the Scotchman is standing at Wood Walton." I turned round then to attend to some of the instruments, when I heard the shunting lever

shake. I fancied that the coal-train was off the road. I turned round to look, and noticed the engine of the coal-train shoot forward, and then for the first time it crossed my mind that the Scotch express had run into the coal-train. I had received Be ready for the Scotch express from Wood Walton at 6.39, and acknowledged it. After that I made no signal to Wood Walton of any sort or kind. I had not cleared the coal-train, and therefore supposed the Scotch train would be standing at Wood Walton, as it would have been if the signals were working properly. So long as I did not clear the coal-train it would be the duty of the signalman at Wood Walton to keep his home-signal at danger in clear weather, and in such weather as the 21st I myself would have kept home and distant at danger. My own signals should have been at danger, as my levers were in the position of danger. I could not see the signals through the window for the snow. I did not go to look at them after the accident. The first thing I remember doing after the first collision was placing the levers of my down-signals at danger. I had received notice of No. 203 passenger-train, the Leeds down-express, leaving Tempsford at 6.35. I do not remember when I got Be ready for it. I hardly know what I did after the first collision ; it never entered my mind about the down-express being so close, as I was so much excited by the first collision. I recollect seeing Mr. Usher come into the cabin, and the guards of the coal-train, together with some passengers. The down-distant-signal from Abbotts Ripton must have worked perfectly at 6.4 for a down-train, because it pulled up a train for shunting. The exact time of the first collision, according to the time at which I received Be ready for the Scotch express would have been 6.44. The south distant-signal must have been working till within 20 minutes of the second collision, because a train had been slacked by it at 6.36. I am not sure that I blocked the line to Stukeley after the first collision. If I had not been so confused I might have stopped the Leeds express at Stukeley. The points at Abbotts Ripton are interlocked, and the points could not have been open for the coal-train to have been shunted without putting the down home and distant signals to "danger." The passengers were all bothering me after the first collision to telegraph to their friends.

William Trowell (sworn). I am a signalman at the Stukeley cabin, where I have been for two months, and before that I had been for about six months at Creeton. I produce my record book, which shows I received a signal, Be ready for 206 passenger-train, the down Leeds express, at 6.47, Train on line at 6.50. It passed my cabin at 6.52, and at 6.52, as that train was passing my cabin, I received five beats on my telegraph bell, which meant line blocked from the Abbotts Ripton cabin. I then ran to my bell and gave one beat and unpegged my needle, and the needle was then pegged over from Abbotts Ripton, which meant that the line was blocked between me and that place. By that time the express had passed. If I had received the five beats a few seconds sooner, I could have thrown my signal up to "danger" and shown a red light from my hand-lamp to the engine-driver. I knew nothing of any collision having happened previously to my receiving five beats from Abbotts Ripton. I had no occasion to stop any trains before 6.52, and therefore did not find any defect in the working of my signals. To ascertain whether my down-distant-signal was at danger, being suspicious because of the weather, I sent a man to it to see, as I had previously had trouble for that reason. On the 8th or 9th of December last, at Creeton, I could not work my distant-signal properly, in consequence of the snow and frost in the morning. When the man, Charles Warren, whom I had sent to my distant-signal, came back, I called out, asking him whether my distant-signal was at danger, and he said "Yes, it is at danger." He did not tell me whether he had done anything to it. I could not see my up-distant-signal on that night as I usually could, because of the snow. I did not report the case of snow impeding the signal at Creeton to any officer of the company, a platelayer having gone and shaken off the snow.

Joshua Pallinder (sworn). I am a signal-fitter in the service of the Great Northern Company, and had been so five years last November. Previously I had been a signal-fitter's labourer. My attention was called at Huntingdon to this collision, and I went with the break-down-train, because I thought I should be required. I reached Abbotts Ripton about 9.30, and disconnected the down-home and up-starting signals, which showed a white light, because some vehicles were on the wires. I then had to go up the ladder and knock the snow off the arms before they would go to "danger." There was much snow on the signal arms. I then went to the up-home and the down-starting signals and I had to do the same thing to them, disconnecting the levers and knocking the snow off the arms. I then went to the up-distant-signal and found John Hall, a platelayer, there, and the whole of a chair tied to the balance weight, and by means of this extra weight of 34 or 36 lbs., he had got the arm up to "danger." I disconnected it, for an engine was on the wires, and then went to the down-distant-signal, where there was a platelayer who had forced it to "danger." I did the same to that signal as to the others, and went on to Wood Walton. I there found the down-distant-signal showing a white light. I forced the signal to "danger," and it flew to "all right" again, when I let it go. I thought the signalman must have his lever to "all right," but I found when I got to the cabin that the lever was in position of "danger." It was the weight of the snow on the wires which kept the signal down at "all right." I had to go along and knock it off before I could get the signal to work properly. After getting rid of the snow the signal worked well. I knocked the snow off the wires on my way to the other distant-signal. I found the home-signals at "danger" as I passed. I don't know how they had got them to work. I found the up-distant at "all right," but when the snow was knocked off it went to "danger." I sent a man to Conington and Holme while I went back to Abbotts Ripton. The signals were in the same condition at Huntingdon, and I suppose they would have been the same all over the line, wherever the snow was falling in the same manner. Last December I had to clear the snow off the signals at Huntingdon, Holme, Yaxley, and Fletton, because they were all more or less obstructed by snow. It frequently is so during snowstorms, more or less; and when a snowstorm comes on, I go out for the purpose of clearing the signals. On the 21st I was out on that duty before the accident. I have had orders from Mr. Scales, my superior, to do so during snowstorms. I never had to do with an accident in a snowstorm before. I reported to Mr. Harrison at Hitchin, accounting for my time, being out in the evening working the snow off the signals, but I had no occasion to do so last December, because the work was done during the day. I never remembered such a night as the 21st for snow. The snow stuck to everything it touched, and in Huntingdon yard the signalman called my attention to the signals at 6 o'clock, and it took me all my time to keep the signals to "danger." On previous occasions the snow has accumulated more gradually. I could not get the snow off by working the balance weights on the 21st instant, and had to go up the ladder and kick it off the arms. I have very often found that signals would not work in snowy weather, but have been able to free them by moving the balance levers on previous occasions.

Amos Piggott (sworn). I am chief signal inspector on the Great Northern Railway, and have been so for nearly 18 years. My duties are to report to the superintendent in reference to the construction or working of signals, and I also superintend the signalmen and their working. On the 21st instant I was waiting at Retford for the down Leeds express, to see it in before I left the station;

I like to see it safe in before I leave. It is due at Retford at 8.40. I joined the general manager's special train at Retford, and reached the spot where the accident occurred about 3 a.m. At Grantham I left the carriage in which I had been riding, and went on the engine, so as to be able to see the state of the signals and telegraph along the line. I found the signals working satisfactorily all the way to Peterboro'; it was not snowing at that time. The telegraph wires were broken down in many places. I saw no snow falling. On approaching Wood Walton I found the up distant-signal at "all right." I presumed that it ought to have been at "danger," and I stopped the engine at the cabin. The home-signal was at "danger," and I asked the signalman why the distant-signal was not at "danger." His lever was, he said, in the position for "danger," and he did not appear to know but what his signal was at "danger." There was a signal-fitter present, named Owen, whom I told to go and put the distant-signal to "danger." After reporting the state of this signal to the general manager, I went to the scene of the accident, and found the down starting-signal at "all right." As the lines were all blocked, I did not trouble about it. I never knew, during 30 years, a single instance of the snow preventing a signal from showing the proper indication. Some years ago, when parts of the railway were snowed-up, I did not see any signal impeded to that degree by the snow. A very deep snow only would bury the wires. On the night of the 21st I noticed that the snow had adhered to the wires. I do not recollect a case of accident on the Great Northern Railway through the snow, nor on any other railway. The weighting of the wires or arms would equally affect the signals. I never had a report of signals being affected by snow. I have not been the person to whom such reports would be made; they would go to the superintendent's office, who would deal with the matter. The last witness, Pallinder, attends to the machinery for working the signals. The snow would be more likely to be shaken off the arm than off the wires, but if the signals were not worked from "all right," then the arm might be fixed by the snow.

(Mr. Cockshott here stated he had had reports of imperfect signals during snowstorms, but never cases of erroneous ones. The cases are very rare of imperfect signals.)

James Radcliffe (sworn). I am telegraph engineer and superintendent on the Great Northern Railway, and have been so for 5½ years. Prior to that I was engineer to the Magnetic Telegraph Company for 11 years. I have had great experience in the maintenance of telegraph wires, and the effect of snow upon them. On the night of the 21st I was roused up and told that an accident had occurred on the line, and that all the telegraph-wires south of Ponton had fallen down. Ponton is 25 miles north of Peterboro'. I came up to Peterboro' and found the wires coated more with ice than with snow; this was from Ponton to Peterboro'. The snow or ice round the wires was in some cases 3 inches in diameter. I did not go further south, for the communication was maintained. I never knew but one occasion, in 1866, where the damage done to the wires was anything like so extensive; then it was greater. The damage was not done by the wind, but by the snow only in this case; on the previous occasion it was done by the wind.

William Henry Preece (sworn). I am divisional engineer to the Post Office Telegraph Department. On the evening of the 21st a storm, accompanied with snow, commenced at the Bristol Channel, and proceeded in a north-easterly direction, embracing a tract of country of about 40 miles in breadth, leaving the English coast about The Wash. It vented its chief fury in the tract of country between Birmingham and Huntingdon. Its characteristic was this, that the temperature of the wires was below the temperature [illegible] air and the snow, so that when the snow fell [illegible]es it froze and adhered to the wires in the form of a pipe of ice. In some places this pipe attained a diameter of about 3 inches. Its weight was measured in two instances. In one case, between two poles, the weight of ice was estimated to be a ton and a half, but I do not know the number of wires; in the other case, the weight upon a single wire was about 200 lbs., in a length of about 80 yards. The storm was accompanied by a gale of wind, which shattered the poles in hundreds. The effect upon the wires was to break them in thousands of places. That covers the district between Huntingdon and Peterboro'. The Great Western, the Midland, and the London and North-Western Railways were affected by the stoppage of telegraphic communication by the storm.

Charles Edmund Oldman (sworn). I reside in Church Street, Spalding, and am surgeon to the Great Northern Company for that district. I left Peterboro' at 6.20 p.m. on the 21st January, in the up Scotch express. It was snowing very heavily indeed. I had previously started from Spalding, and had changed trains at Peterboro'. I noticed nothing between Peterboro' and Abbotts Ripton. I rode in a second-class carriage about the middle of the train and in the end compartment. There were two passengers with me, one of whom was the valet of the Russian Ambassador. The first thing I experienced was being thrown from the seat upon which I was lying into the arms of M. Lelich. I afterwards found myself on the ground, and when the crash had ceased I crawled out on my hands and knees. Finding then that I was not much hurt, I attended to my fellow passengers. Having placed the valet at the foot of the signal-box, I observed the down express approaching, and rushed up into the signal-box and said to the signalman, "Why on earth have you not blocked the line and stopped that train?" This was just as the second collision occurred; and the signalman replied, "I have, sir; look, they have come against their signals." He pointed at the same time to the dials to show that he had blocked the line, but I did not notice what condition they were in. I went down again on the line to render further assistance, and quarter of an hour or 20 minutes later I went again to the signal-box, and noticed only one lever down, pulled over from the forward to the backward position; the rest were all in the forward position. The only signal-post I noticed was the home-signal towards London, and I saw a white light from the back of the lamp.

John McDiarmid (sworn). I am a guard in the Great Northern Company's service and have been so 14 years, and for the whole time I have been running as head guard with the fast trains from Edinburgh to London. On the 21st January I left Edinburgh at 10.31 a.m., one minute late; got to York at 3.29 p.m., and left at 3.48, three minutes late. We were checked two or three times by signals between York and Peterboro', and reached the latter place at 6.19, and left again at 6.24, six minutes late. I found a little snow first in coming to Grantham. On leaving Peterboro' my train consisted of an engine and tender, a break-van, a second-class carriage, a first-class carriage, two composite, three first-class, a second-class, and a break-carriage—ten vehicles. I rode in the front break-van next behind the tender. I looked out after leaving Peterboro'. I cleared the window from time to time, but as fast as I cleared it the snow came on again. I saw one or two signals after leaving Peterboro', but no others until the collision occurred. I am not sure that I did not see Holme signals, but I did not see the signals at Conington, Wood Walton, or Abbotts Ripton. It is my impression that we went into the coal train full speed on, the usual speed of the train. It did not occur to me at the time that there was any necessity for slackening speed. The weather decidedly does affect our running. I never saw a heavier snow than that which fell between Peterboro' and Abbotts Ripton on that night. I have heard that signals are liable not to act well in snowstorms. It is our practice to run more cautiously in bad weather, and we have

sometimes to ascribe time lost to snow or fog. I should have expected the engine-driver to exercise more caution in keeping a keen look-out and slackening speed on such a night as the 21st, and everybody should be ready for an emergency. The snow was beating against the front of the van, and would be in the driver's face. I know nothing until I was thrown down by the collision and buried amongst the luggage. I then got up and out of my break and proceeded to the front, and they were at that moment despatching an engine to stop the down train. I then went to the back of my train and saw that the second-guard was out of his van, and that the side-lamps were right; I also heard that the rear-guard had gone back to protect the train. Afterwards I went forward again, and saw the position of the carriages. I have an impression that I was in the signal-cabin between the two collisions. There were people in the cabin, and I cried out "Block both roads." The signalman did not reply, but some one said the blocking had been done. The signalman was watching one of the telegraph-instruments. I noticed the up home-signal, and saw it showed a white light; there was snow on it, and I saw snow on the wires of the distant-signal. I did not notice whether there was any of the wreck of the collisions on the wires. I was shaken and a good deal bruised by the accident. I went home to Edinburgh some time after the accident. I knew nothing of the coal-train when leaving Peterboro' on that night. I have not noticed the coal-train on previous occasions, neither have I had any difficulty with it before. We did not pass over any fog-signals that night. I did not notice any of the passengers interfere with the signalman at Abbotts Ripton. (Mr. Gaches, solicitor, quotes a rule, saying that when signals were not visible, speed should be immediately reduced, so that trains could be stopped at the signals.) The obedience to those rules is left to our discretion as to the reduction of the speed. The engine-driver should reduce his speed so as to have his train under control. Slackening because of the weather might make a difference of 3, 4, or 5 minutes between Peterboro' and Abbotts Ripton. I never heard of any "brushing" of my train at Abbotts Ripton. I could not tell at what speed we were going within a mile or two on such a night. I do not know at what time the collision occurred. It is the engine-driver's duty to regulate the speed of the train, and I cannot tell what he saw in regard to signals on the night of the 21st.

William Elijah Mason (sworn). I am a platelayer in the service of the Great Northern Company, at Holme, and have been so since 1869. I live about three minutes walk from the Holme station. On the night of the 21st January I was at home, when somebody came to fetch me; it was William Marriott. He told me to go to the signal, and I went to the down distant-signal, as I usually do when called out in that way. I left Holme between 6 and 7 o'clock and it would take about a quarter of an hour to walk to the signal. When I reached it I found the signal standing below "caution," that is to say the arm was less than half way up; it was very nearly into the post. The snow kept it in that position, owing to the weight of snow sticking on the arm. I worked the balance-weight up and down, and a great quantity of snow fell off the arm. When I first reached the signal it showed a white light, and when I knocked the snow off the arm it would go up to red. I stopped at the signal all night and until about 9 o'clock in the morning. It left off snowing about 12 o'clock. I had to free the signal of snow about every half hour up till 12 o'clock. The Scotch express train had passed before I left my house, and the up stopping train was in the yard. I have been out in fog, but not in snow before that night. I have only been acquainted with the signals since November. I expected to find snow on the signals, because it had been snowing so heavily. The snow seemed to cling to the signals, and I had difficulty to shake it off. It was a very rough night; rougher than I had ever witnessed. I did not go out to the signals earlier, because I had only just got home and had my supper. Clark and I have never spoken about signals getting clogged by snow.

Joseph Wills (sworn). I am 14 years old to-day. I am employed as lad porter at Holme station. I open and shut the gates, and go on messages. On the evening of the 21st January I was sent by Mr. Gregory, the station-master, for William Marriott and Elijah Mason. It was just after the Scotch express had gone by that I was sent for Marriott and Mason. I had to tell them to go and see to the signals. I saw them both, and they came at once to the station. The men were sent for because it was coming on foggy, and there was snow. The train which followed the Scotch express had not passed when I left for the platelayers; as I was returning I saw the Manchester train go by. I was on the up-platform when the coal train passed, but did not notice the signals. I heard some of them say the coal train had run past signals. I have sometimes been with the signalman in the cabin. I remained at the station until the Scotch express had passed, and before then I saw Mr. Gregory come out to meet the down-train. I did not see the signalman, nor hear him call out or make complaints. Marriott and Mason live close to one another. I cannot tell who it was said the coal train had run past signals. Mr. Gregory came into the porters' room to send me for the platelayers. I saw Mr. Gregory on the platform when the down-train arrived; he had been there some time before, between the time of the coal train and the "down" train. He was about there most part of the time. I cannot tell whether it was before I went into the porters' room or while I was there that I heard that the coal-train had run past signals. No one has said anything to me about my evidence at the inquest. (*This witness showed great reticence under examination, and it was impossible to get a complete statement from him.*)

Gregory (re-called). I was in the office when the coal-train passed, and when the signalman came to me. He said the coal-train had run past the signals. That, I think, was before the down-train came to the station; I cannot say distinctly. I went to the signal-cabin at once, and saw that the signal-levers were in the position of "danger." I then went to look at the up-starting-signal, and saw it was at "danger," but a very dim light. Then I went to the up-home-signal, and saw it was at "danger." I then called the lad, Wills, to fetch the platelayers. It was from the level-crossing I spoke to the boy, who came from the lamp room. It would be about 20 or 30 yards from where I stood to the boy. He came to me at the crossing, and I told him to fetch Marriott and Mason, the platelayers. It was immediately after that that I went to the up-home-signal, and saw it showing a red light. I then went back to the station, and the down main line train left, and the down branch train to Ramsey. The Scotch express had not yet passed. I was satisfied that the up signals were working properly. According to the book the coal-train ran past signals at 6.21; next a stopping train arrived at Holme station at 6.25, leaving at 6.26; next a fast through train passed on the down line at 6.35; next the Scotch express at 6.37; and next a through up-passenger-train at 6.50. I saw the boy leave on his errand rather reluctantly; he went in the direction of the platelayers' houses. It is my impression that I sent the boy away before the Scotch express passed; but I won't swear it. I was on the platform when the down-stopping-train left, and also when the down-fast-train passed; and between them I started the down-branch-train. I might have spoken to the boy between the down-fast and the up-Scotch-express. I am positive I was on the crossing when I sent the boy away, and I am under the impression that it was on my way from the up starting-signal. I went to the signal-cabin a second time after being to the up-home-signal. The porters at the station are named Marshall, Cleave, and a supernumerary, Leighton, who has been there about six months. Of the

other two, Marshall has been at Holme a month or five weeks. The boy Wills principally attends to the gates and assists me. I call the porters by their surnames. I never heard the boy calling these men. Marshall's christian name is Thomas. I went a second time to the signal-cabin to ask the signalman how his signals were working. If a train were late I should know it, as I should be expecting the train. When I went into the signal-cabin first I asked him how he accounted for the coal-train running past signals. He said he could not tell, and pointed out that his levers were in the position for "danger." I did not hear from him that he had conversed with anyone on the instruments that the coal train had run past signals. I have been nearly 13 years at Holme. I have had occasion to pull up the expresses. A coal-train has broken down; I don't know that trains have run past signals. I cannot say what punishment I might have had if I had stopped the express. I did not think of being fined. Our instructions are to work the trains properly, avoiding delays. I have never been censured for stopping the expresses; but they were very different occasions to this. It is not the duty of myself or the signalman, when the train has run past our signals, to telegraph the fact to the station at the immediate rear. I have heard that signalmen fight for the possession of the telegraph circuit. I may have heard the Holme signalman speak of that, but he has not made a report. I do not know that I have made a report on the subject. I think I should have been censured if I had stopped the express after having received line clear from Conington. I do not think that I would have been justified in stopping the express on that night. The platelayers came on duty as soon as they could have been expected. My impression is that Marriott was at his signal before the Scotch express passed. Marriott and Mason should certainly have seen the Manchester express pass. My idea is that I should have been censured if I had unnecessarily stopped the express; and I did not think it necessary on that night. I have had complaints made verbally to me by Osborne as regards the difficulty of sending on trains by the instruments, but have never taken notice of those complaints.

Osborne (recalled). The coal train ran past my cabin at 6.21, the levers of my home and starting-signals being at danger. I then called myself for Mr. Gregory. He came immediately, and stayed a minute or two. I told him about the coal train, and he went away at once. I sent on the speaking instrument to Abbotts Ripton, "He has run past signals" at 6.26, referring to the coal train. The message might have been seen at Peterboro', St. Neots, Huntingdon, Abbotts Ripton, and three boxes at New England yard, if they had been looking at the instruments. I cannot recollect that the station-master expressed his intention of sending for the platelayers. My intention in telegraphing to Abbotts Ripton as I did was to inform the signalman that I had intended shunting the coal train at Holme. It was before the down trains passed through that Mr. Gregory came into my cabin. When Mr. Gregory came up the second time he said that the up home-signal was not working properly. I don't think he said anything else, and he stayed only a very little while. We did not discuss stopping the express at Peterboro'. I think that Mr. Gregory was not in the cabin when I received line clear from Conington for the coal train. I should not telegraph to a station in the rear when a train ran past signals. I received notice at 5.50 that the express had left Grantham at 5.46, and might have known therefore that the express had not left Peterboro' when the coal train ran past my signals. The Scotch express was late at Holme. Mr. Gregory gave me no instructions when he came into the box. I have
plained of fighting on the wires to Mr. Gregory
nes. The men are not playing tricks, but
to send his message first. An S.P.
ll that; we should give up the instru-
should have received from Peterboro' a message in regard to the Scotch express, and I might have received it, but it is not booked. I could stop fighting on the wires. It did not occur to me when the station-master informed me about the state of the Holme signals that other signals might be in the same condition. There were 16 minutes between the express and the coal trains, and two block stations, and I thought the express ought to go forward. I complained to the station-master of fighting on the wires, with a view to showing that I could not get through what I had to do, because there were too many on the circuit. I made no written report.

John Thomas Marshall (sworn). I am a porter in the Great Northern Company's service and have been so for a month to-day at Holme station. I know the lad porter at Holme; his name is Wills. He has called me by different names. I heard Osborne tell Mr. Gregory that the signals would not work. Mr. Gregory watched the signals, and seeing they did not work properly he sent for the men. I saw there was a white light instead of a red one, and I knew it was because of the snow. After that I was attending to other trains and things in the yard. The boy Wills I saw in the porters' room after all the down trains had gone away. I saw the Scotch express pass, but I don't know where the boy Wills was then. About a few minutes before 7 I saw Wills taking the tickets of a train. I did not hear or see the station-master send Wills on a message.

Silas Bradshaw (sworn). I am a signalman in the employ of the Great Northern Company at Abbotts Ripton, and have been there a twelvemonth. I was on day duty on the 21st January, and left at 6.7 p.m., and went to my cottage, about 200 yards from the cabin. I heard the first collision, but I did not know at first what it was. I was told there had been a collision by Pantling, a porter. I at once went to the box, and reached it about 6.57 or 6.58, just after the second collision. I saw at the cabin that all the levers except No. 10 were in the forward position, and I also saw that the telegraph instruments were at "Train on line" both for the up and down lines. I saw Johnson, and he asked me whether I would send the messages about the accident. I asked him what messages he had sent, and he said none, but he had been trying to do so. I told him I would try to send the messages. I only thought of working on the talking instruments. I sent messages to Huntingdon and Peterboro', to the effect that 156 had run into 175 coal, and that they should send doctors and help,—at 7.5 to Huntingdon and 7.9 to Peterboro'; and I was under the impression those were the first messages that left the cabin. It was about two minutes before I got the instrument, which was engaged. As soon as I got the others stopped, I broke in with S.P., a special message, and then informed those on the circuit that they were to keep off for Abbotts Ripton, where there had been a serious collision. Johnson wrote the message which I sent previously to my going into the cabin. I got no replies from Huntingdon or Peterboro' beyond the acknowledgments from both places. It was snowing hardest about 6 o'clock, when I went off duty. I had had no trouble with the signals. I have never found any difficulty in sending my messages because of there being too many persons on the circuit. The message sent at 7.5 was headed F.J., meaning 6.45. I was able to send the message almost immediately. Johnson was confused at the time, and I felt I was more able to transmit the message than he. F.J. was in Johnson's handwriting. At 6.58, when I entered the cabin, Johnson appeared to be doing his best to send the message. It is usual to write down a message before sending it.

Johnson, signalman (recalled). I have some recollection of having rung five bells to give the block to Stukeley. I remember Bradshaw coming into the cabin and trying to send a message. I first tried to send the message without writing it. That would be two or three minutes after the first collision, and

before I sent the five bells to Stukeley. I put the code time at the head of the message at which I first tried to send it. I used the sign S.P., and if I could have gained attention it would have been visible to everybody on the circuit from Peterboro' to St. Neots. I kept trying now and then to send the message; the passengers wished me to telegraph to their friends and one thing and another. I asked Bradshaw to send the message—he was cool. I have previously found difficulty in sending messages, but I have not complained, for we can't all use the instrument at once. I have never complained to my superiors about it. We don't have much conversation. I had been advised of the Scotch express from Essendine and Peterboro'. It left Essendine at 6.1, and I was informed at 6.17. I cannot say why I did not hear of it before. It left Peterboro' at 6.24, and I was informed of it at 6.31. The delay would be because other people were using the circuits. We would never put S.P. to a train message. I did not think it wrong to receive information that the express and coal trains were so near each other, because of the block and signals. The levers of the signals could not be altered after the collision occurred. I remember Mr. Usher coming into the cabin. He might have asked me whether I had blocked the lines. Holme told me that the coal train had run past his signals, with train on line. I did not recollect that message when last examined. The platelayers had just gone out fogging at that time. I did nothing in consequence of receiving the message that the coal-train had run by signals. It is not an ordinary thing for trains to run past signals. I did not send to Huntingdon that the coal-train had run past. My first duty would be to block the line to Stukeley, and the reason I did not do so was that I had never dreamed of the down train. I did not know until the Stukeley man told me at what time I had blocked the line. I immediately put the signals to danger. I did not get train on line for the express. I could not because the instrument was pinned over for the coal-train to shunt. It is a common thing when telegraphing a train to add some observation as "heavy," "light," and so forth. When I heard the message about the coal-train I knew that the Conington and Wood Walton, as well as my own signals, would be against the express. I had not the least notion that there was danger of a collision between the express and coal trains. The Essendine signalman would have to telegraph to six stations before Abbotts Ripton of the approach of the express, a separate message to each place, through two circuits, and that would account for the time between the leaving of the express and my receipt of the information. I did not know that the first collision had obstructed the down line; I supposed it might be obstructed, though I could not see. I did not give line clear to Wood Walton because the coal-train was not in the siding. In fine weather I would have done so.

Rose (recalled). The reason I did not show a red light from my hand-lamp to the express when I had not received line clear for the coal-train was because I was using the lamp for drawing down a train of empties. I have never experienced difficulty in sending messages owing to fighting on the wires. The Scotch express passed my cabin at 6.40, and at that time there was a train of empties on the down line. There was a train preceding the train of empties which had not been cleared from Conington, and I was drawing the former train within the signals. If I had been at liberty I would have shown a red light from my hand-lamp to the Scotch express. It would be better if I had a speaking instrument at Wood Walton; we should know the whereabouts of trains earlier. It would facilitate the working. The train of empties was stopped by my fixed signals.

Walter Blatch (sworn). I am a telegraph clerk in the service of the Great Northern Company stationed at Peterboro'. I have been there seven years. I was on duty on the night of the 21st January. My duty was to send messages and forward statements about the times of trains. With regard to the Scotch express it was first reported to us as leaving Newark at 5.14, received by us at 5.19; next left Grantham at 5.46, received at 5.47. We forward the information to each station as far as Huntingdon by separate messages. At this time there would be three clerks in the office. We next heard of the express leaving Essendine at 6.1, received at 6.9, and transmitted the train then to Abbotts Ripton and Offord. Next is the time of leaving Peterboro' 6.24, forwarded to Holme at 6.26, Abbotts Ripton at 6.27, Huntingdon (North) 6.28. The first unusual thing that occurred was that I was waiting to send on a train at 6.45, watching the instrument and found it engaged; somebody, I could not tell who, was calling Huntingdon. Then I saw (6.47) him offer Huntingdon a message with the prefix S.P. Huntingdon did not acknowledge it. Abbotts Ripton repeated the message but it was not acknowledged. Abbotts Ripton then left the instrument. There was nothing at that moment to prevent the message, if Huntingdon had attended. Huntingdon only acknowledged the Abbotts Ripton code and then ceased. Huntingdon should have given either "understand" or "not understand," which he did not do. When Abbotts Ripton left the instrument I took it, as he could have stopped me again in a moment. At 6.50 then I sent the train to Holme, 6.51 to Huntingdon north and south, and 6.52 to Offord. When I had transmitted my train, I saw some one calling Huntingdon at 6.52. He called some little time, gained his attention, and sent S.P. message again, to which Huntingdon gave M.Q., which means that he was engaged. A telegraph clerk would not think of giving M.Q., which means wait, in answer to S.P. Abbotts Ripton went on calling Huntingdon again and got attention, and again offered his message S.P. Huntingdon again gave M.Q., and Abbotts Ripton then told Huntingdon he must take his message; that it was important. I thought the second calling, which began at 6.52, was better than the first. I saw the contents of Abbotts Ripton message, which was that the Scotch express had run into 175 coal train, and for them to send assistance at once. We only send on passenger trains. I should leave any other work to attend to an S.P. Abbotts Ripton was calling Huntingdon south, the code being H.G., Huntingdon north being H.K., at 6.51. He gave S.P. three or four times.

Richard Maddison (sworn). I am a signalman in the service of the Great Northern Company, and was in the Huntingdon south cabin on the night of the 21st January. After 6.45 I noticed some one calling Huntingdon at 6.57, the Leeds express having passed at 6.49. I found it was Abbotts Ripton. He gave me Abbotts Ripton S.P. and then "To"; I replied "Send code time," and then some one interrupted. I asked him to do so because the other was unbusinesslike. After watching for half a minute I attended to my levers and shook them, in order to shake the snow off the arms. I noticed no calling. I called Abbotts Ripton at 7.2. I then got A.R.,—Abbotts Ripton. At 7.4 Abbotts Ripton called me again and I gave M.Q., because I thought I had a train, but it was only an engine; I heard it whistling, and I went to my signals to protect it. At 7.5 I went to the instrument and took the message, "Code time F.J., No. of words 16. From Abbotts Ripton to Huntingdon. Send doctors and help 156 into 175 coal." I did not get a call from Abbotts Ripton at 6.47. Between 6.20 and 6.49 I had no trains in, nor between 6.49 and 6.57. I did not get a call from Abbotts Ripton before 6.57. I did not give M.Q. before 6.57. I was in charge at the time; there was no one else in the cabin. I found the levers were not working properly at 6.34, the levers went back too hard and came forward too easy. The up and down levers were obstructed. I noticed that the up home and distant signals were clogged at 6.8. My reason for sending M.Q. came in at 7.4 had to be

indicate an S.P. Everything should give way to an S.P., but if the signals have to be put up the instrument must be left. At 6.49 I telegraphed the Leeds express on to the north box, which occupied about a minute. I did not hear or see any calling between 6.47 and 6.57. I did not see the letters A.R., nor S.P. nor H.G. Abbotts Ripton has communication with the north box. The south box would be the proper box for any one wishing to communicate with the station-master to address; it is the order. 6.57 was the first time I heard Abbotts Ripton calling me. North Huntingdon was working his instrument at 6,49, and I know it because of his book, which he shewed me. I got Train on line for the express from Offord at 6.46, then I would give Be ready to north box; I would then make the entries in the book, Be ready 6.44, On line 6.46; then I gave On line to the north box at 6.46, and would make the entry, time it passed me 6.49, line clear to Offord 6.49, and clear from Huntingdon north at 6.49 also. There were no entries made by me between 6.46 and 6.49, and again between 6.49 and 6.57. After 6.49 I received On line from Offord at 6.49 for the down Manchester goods. I gave north box Attention and the Be ready at 6.49. I had also to attend to my semaphore signals. The Manchester goods arrived at 6.57. I put my signals up for an up train, and went to my instruments again. To get a train through there must be 18 operations, besides booking the time of passing. Besides I have to work two signals, dropping them and raising them. My attention is called to the express at 6.44; I get line clear at 6.49, and during the time I am either giving messages or waiting for them. Between giving M.Q. and receiving the message would be about six moments. I did not give M.Q. at 6.57, but asked for the code time.

Harry Gurney (sworn). I am a signalman in the employ of the Great Northern Company, at the St. Neots station. I have been there about three months. I have been a signalman two years and three months. I was on duty on the 21st January. At 6.24 I received an express from Peterboro' and at 6.37 I received it from Holme. Again at 6.41 I received an express from Peterboro'. Next at 7.47 I got 84 goods from Huntingdon. About 6.47 I noticed Abbotts Ripton calling Huntingdon. He gave him S.P.; it was to the south cabin. After Abbotts Ripton gave his S.P., he added "From;" Huntingdon stopped him and said, "Code." I was then called to attend to the Scotch express. I saw nothing more until 7 o'clock, when I saw the message "Send doctors and help, &c." I happened to be looking at the clock at 6.47. I should think it was about 6.50 when I was called about the Scotch express. The word code would mean the time on the clock.

John Jolley (sworn). I am a platelayer on the Great Northern Railway at Abbotts Ripton. I was on duty on the 21st January, and went home to get tea about ¼ past 5, and about 20 minutes to 6 came out again. I did not hear any down train coming, so I went in again. It was snowing very hard. I saw the coal-train coming, and I cleared the points of snow to enable it to shunt. I was in the signal cabin when the first collision occurred. I went into the cabin to get my fog-signals. I saw the signalman calling on the driver of the coal-train to make haste and get into the siding, that the Scotchman was waiting at Wood Walton. While I was reaching the fog-signals the collision occurred. After the collision I went to the Abbotts Ripton porter to ask him to assist. As soon as the collision occurred I saw the signalman go to the talking instrument, and take hold of it. I did not see him write anything down. I then went away. Johnson only said the Scotchman was into the coal train. I went up the line to stop the Manchester train, and saw the distant-signals showed a white light. John Hall could be sent fogging by the Abbotts Ripton signalman. Johnson asked me to go fogging when I spoke to him about the points being clear for the coal train.

John Hall (sworn). I am a platelayer in the [illegible]rt Northern Company's service at Abbotts Ripton and have been so for 20 years. I never saw such a night as that of the 21st January. The coal train was shunting as I came up. I went into the cabin and got my fog signals, and saw the collision as I was leaving the cabin. I had intended to go to the up distant-signal to attend to it. If the snow impeded the working I should have shaken it off, if I could, or put down fog-signals. It snowed a little before I went to tea, over half-past 5, and when I came out the coal-train was shunting. I would not go out fogging unless the snow was very severe. If I am wanted I am sent for after going home from my day's work. I remained in the house without knowing what was the weather until I was fetched out.

Frederick Rouse (sworn). I am district locomotive superintendent at Peterboro'. I heard the engine-driver of the coal-train say that he lost some time owing to washing out. The engine had been undergoing repairs and the steam could not be got up until four or five minutes late. When he got into the coal yard his line was obstructed, and he had to be turned into another line, and had then to go back to his train. In doing this, owing to the points being clogged by snow, the engine was turned down the wrong road. I believe Bray, the driver, made some report about losing the time. I have known coal trains start late. There is sure to be inquiry in such cases. If in the particular case, I found the best had been done, I should caution the people concerned. I think the storm of the 21st January was the worst I recollect. I have had experience of running in fogs and snowstorms. If the signals are not distinct, greater care should be taken, and speed reduced; but if they could be seen a driver might be justified in not doing so, simply because they might be giving wrong indications.

Thomas Colbert (sworn). I have been 21 years in the Great Northern Company's service, and at Peterboro' eight years. I communicate with all stations down to St. Neots by telegraph speaking instruments. I produce my record book, which shows that the coal-train passed me (in the Crescent junction cabin) at 6.5 p.m. on the 21st January. The express, 156 up, followed at 6.26; the next was 139 express, which passed at 6.39; then a slow passenger at 6.45. A lad who was with me told me about 6.50 that Abbotts Ripton was calling Huntingdon; he was looking out for another message. I would expect that message from 6.47 to 6.53. The lad told me about 7 o'clock he thought something was the matter as Abbotts Ripton was sending an S.P. I had no time to attend to it myself. I believe the S.P. message was "Send doctors and assistance, &c." The coal-train would travel about 20 and the express 45 miles an hour. The former would get to Holme in 21 minutes, and could be shunted in four minutes. I said nothing about shunting the coal-train at Holme; I thought it unnecessary. We regularly let coal trains start in that way. It would be for the signalman at Holme to decide if the coal-train should be shunted there. There was ample time and to spare for the coal-train to get to Holme, and be shunted before the express came up. It was perfectly safe under those circumstances to work the coal-train in that way.

Usher (recalled). When I went into the cabin on the night of the accident I saw the signalman working the instruments. I asked him whether he had blocked the down road. Stukeley was not mentioned. When I heard that he had blocked the lines I thought it was safe.

James Osborn (sworn). I am a telegraph lad in the Great Northern Company's service, and have been so about 15 months. I have been doing duty in the Crescent box, on the south of Peterboro', with witness Colbert, who is the signalman. I was on duty there on the 21st January, and watching the telegraph instruments. I saw Abbotts Ripton (A.R.) trying to call H.G., Huntingdon; it was about 6.52, and I told the signalman A.R. could not get H.G.'s attention for two or three minutes. I saw nothing but H.G. given by A.R. until I interfered with C.R.,

when Abbotts Ripton gave S.P. I then left off, and Abbotts Ripton began to call H.G. again, and P.E., meaning Peterboro' office. I did not notice anything else on the instruments until the message, "Send for doctors and assistance." The S.P.'s are very special and rare at our cabin. We do not take S.P.'s in our cabin, but I should see one passing through.

Mr. Piggott (recalled). I have examined the books at the various telegraph boxes on the circuit with reference to the calling and messages connected with the accident, and made the following report to the superintendent of the line. I have questioned the signalmen on the circuit as to Abbotts Ripton having called Huntingdon at 6.47, and can get no more evidence than what has been already received. S.P. is regarded as something urgent, and a signalman should take it at once. If there were fast trains passing they must have attention. A signalman's common sense ought to have induced him to take an S.P. from Abbotts Ripton instanter. I should think the way in which Maddison accounted for his time between 6.46 and 6.49 was sufficient, though I consider an S.P. message might and ought to have been received at that time. The train in question having been three minutes passing between Offord and Huntingdon, and only half a minute required for recording, at about 6.47 he would be watching for the train passing the distant-signal, but S.P. being so unusual from Abbotts Ripton, he ought to have been anxious to know what it was. The signals are the signalman's first consideration. He is on duty 12 hours, but there are slack times in the day. I am not sure that Huntingdon could have received the S.P. message before 6.49., even if he had prepared himself at once to take it. The message, "Express ran into the coal-train," the particular message which was sent, could be taken in one minute.

Report referred to in Mr. Piggott's Evidence.

GREAT NORTHERN RAILWAY.

Signal Department,
Retford, February 12th, 1876.

Telegraph Circuit, St. Neots to Peterboro'.

Sir,

I have to-day visited St. Neots, Offord, Huntingdon, Yaxley, and the Crescent, Spital, and Westwood junctions. [These are all comprised in the circuit; New England north is not.]

I am unable to trace anything on the circuit that should have hindered the S.P. message being promptly despatched from Abbotts Ripton, except Crescent junction interfering while Huntingdon was being called, and Peterboro' transmitting the trains as late as 6.53.

No. 203, down express, passed St. Neots at 6.41, and was telegraphed to Westwood at 6.44.

No. 150, express, left Peterboro' at 6.45, and was signalled to Holme at 6.52, and to Huntingdon at 6.53.

The only interruption I can discover, in addition to that referred to by Mr. Blatch in his evidence, is that telegraph lad Osborn in the Crescent junction box states he noticed someone calling Huntingdon at about 6.50; he stopped them and began to call Abbotts Ripton, at the same time giving the Crescent junction code call "C.I." Abbotts Ripton replied by giving S.P. Osborn then gave up the circuit, and someone recommenced calling Huntingdon, and continued calling for some time.

Osborn did not see any further interference, but observed that whoever was calling did not readily gain Huntingdon's attention.

I am under the impression it was Osborn's interposing that has been referred to as "the interruption."

167, down goods, left Offord at 6.49, but Offord was unable to telegraph this train, owing to the instrument being engaged.

Signalman Leaman of Offord states he observed at about 7 p.m. some one gave S.P., but he neither interrupted nor noticed what followed. He was engaged with the block instruments.

The Huntingdon South box was also engaged with the block instruments at 6.44, 6.46, 6.49, 6.52, 6.57, 6.59, 7.4, in addition to signalling and making entries in his books.

No one on the circuit appears to have observed any interference, except the Yaxley signalman, who states he noticed an interruption between 6.45 and 6.50; this is doubtless the time when lad Osborn of the Crescent junction took possession of the circuit as hereinbefore mentioned.

I cannot trace another case of anyone interfering with the instruments, except the instance quoted by Mr. Blatch, when he transmitted the trains.

Yours obediently,

F. P. Cockshott, Esq., AMOS PIGGOTT.
King's Cross.

John Corble (sworn). I am inspector at Peterboro' station in the service of the Great Northern Company, and have been inspector for 11 years, 8 years at Peterboro'. I was on duty on the evening of the 21st January, and sent forward the Scotch express at 6.25 at the station. I gave the guard the signal to start. I did not know what trains were preceding it; that would rest with the Crescent signalman. There was nothing unusual about the leaving of the Scotch express; it was seven minutes late. I saw the telegraph clerk, but made no inquiry about trains in front, nor was it my duty to do so. He did not tell me of any message. I did not see the coal-train pass. I see a semaphore arm lowered, and then start a train; it is my duty to act on the Crescent signal.

Henry Oakley (sworn). I am General Manager of the Great Northern Railway and have been so for many years; 25 years in the service of the company. The Scotch express was stopped at Doncaster. I was there. The train is ordered never to go through that station at more than ten miles an hour. It stopped to take up Lord Colville, and the detention was not more than half a minute. We stop trains two or three times a week to accommodate the public, but I might state positively that the officers never stop trains for their own convenience. There were directors seeing the Corporation at Doncaster; we thought it only right to stop and take them up. I have never heard of any single instance of a signal being so affected by snow as to give a wrong indication to a driver. Like all mechanical arrangements, signals are liable to failure, and an imperfect signal might be given. A formal report signed by every signalman is sent to the superintendent, stating if a signal has failed, and why, and accompanied by a report from the signal-fitter explaining the defect. In December the defect was that the arm when moved for danger did not go quite to a right angle, but there was nothing to lead us to suspect that a signal might give a wrong indication. The great aim of railway companies is to keep time, and our efforts are exerted to preserve punctuality and safety, and the former should always give way to the latter. There is no doubt that in fog and snowstorms drivers keep their trains under control. The danger of signals showing wrong indications was quite unapprehended. We had confidence in the block system in preserving an interval of space, and thought the signals might be relied upon. The signals which failed were those which would be used under other systems of working than the block. I never heard from anyone in our service that a signal had given a wrong indication; we knew they worked stiffly. It would undoubtedly be prudent when signals may be affected to reduce speed; but this was a novel danger, and we are already considering how such dangers can be avoided under all circumstances. Certainly punctuality should give way to safety, but when you begin to justify unpunctuality you disarrange the traffic, and the relative positions of trains ought to be, if possible, maintained. In cases of fog we take off trains (goods trains), and it might be equally desirable in snowstorms, but I hesitate to think of disarranging the traffic. We are

already required by our directors to report what are the best means of preventing such dangers. The directors have never received reports of erroneous signals being exhibited. With regard to continuous breaks, we have, with other companies, experimented with all the known kinds in use at home and abroad. The result of those trials have not been communicated yet to the company. We have two trains running with continuous breaks under different conditions of gradients. We have not had sufficient experience to rely on the vacuum break under all circumstances, owing to the attaching and detaching of carriages. Any break that can be used must afford great facility for interchange, and the attachment must be perfect, else we should place in the hands of drivers power which might fail at the greatest need. Then we have to arrange with companies with whom we interchange stock, and consequently to that extent the breaks must be universal. I think no company has quite made up its mind that any known system of continuous breaks could be universally applied, and it would, I think, be unwise for any company to furnish itself with a particular break without considering interchanging companies. I quite approve of continuous breaks, fully recognising the necessity for them. We are in the condition of waiting and trying to find a break worthy of our adoption. The train which, in reference to the Abbotts Ripton case, we have made up for experiment, is as nearly as possible similar to the original down express train. Frequently the guards at the tail of a train cannot hear the engine's whistle for the breaks. The front guard is the head guard. The guards would generally be able to sort the luggage in five miles; there may be sometimes 100 parcels to sort. I have not heard of guards being hindered by luggage from getting to their breaks. The order for men to go out in fogs and snowstorms was simply an additional precaution. The men should have stopped to work the signals if the snow had begun before they went home to tea; the meals should be sent to them, as provision is made. The clerk in charge of each station and permanent-way inspectors are ordered to do this. On the day in question it is only said that snow was falling lightly when they went to tea, and on that night food was sent out to the men. If they had not gone home to tea before 8.30 they would have had something to eat. The driver was not bound to reduce his speed unless he could not see the signals at a distance of 150 yards. He could bring his train to a stand in 700 or 800 yards, perhaps 900 yards on the gradient. Presuming the driver of the down express heard the fog-signals 1,000 yards from the fouling-point, he might have pulled up. I might say that we have never heard of a train running past the home-signal after the warning of the distant-signal. A speed of 15 miles might have produced the same effects in regard to the position of the wreck. It is possible that a man may be engaged with a down train when he wished to show a red hand-light to an up express, but he ought to attend to the more urgent. On that occasion it was not urgent, because he might have thought he could rely on his signals. There was no undertaking in the Great Northern Company's Act of Parliament that they should lay down a separate line of rails for mineral traffic. We do not think the time has yet come for a third line of rails between London and Peterboro'. We have 35 miles of third line in operation, and 13 in construction. The third line is used for any down slow trains. We have lately been considering the advisability of putting a third line up this particular bank at Wood Walton, so as to prevent the delay to fast trains. It would be from the Conington cabin no doubt to Huntingdon. I do not think it reasonable to expect that the platelayers at Abbotts Ripton, after a hard day's work, should have kept a look-out for the weather. Every irregularity of every description, and neglect on the part of fogmen, would be reported. The station-master at Holme might justly have thought the express could go forward on the occasion. If signals fail, the block system is perhaps worse than the time system. Certain cabins have no conversing wire, and on occasions of accident one would be useful, but under ordinary circumstances they would be unnecessary where now absent. A conversing instrument would be of assistance. Lord Colville was at Doncaster on the Company's business. In regard to the question of continuous breaks, the practice of slipping carriages would have to be considered. The driver must obey signals, whatever they are, and then his responsibility ceases.

Enoch Catley (sworn). I am an engine-driver in the Great Northern Company's service; it is 21 years to-day since I entered the service; and I have been driving fast trains about 15 years. I remember the 21st January, when I left Peterboro' at 6.25 p.m., without particular instructions or warning. The first thing that happened out of the ordinary course was pitching into the coal train. The signals were at "all right." I saw nothing but white lights all the way from Peterboro'. I noticed the Wood Walton signals particularly, all white, distant and home. The distant-signal at Abbotts Ripton was a bright white light, not an imperfect signal, and visible at 600 or 700 yards. It was snowing very heavily as I passed Wood Walton and approached Abbotts Ripton. We were going from 40 to 45 miles an hour, the usual speed at that point, the same speed that I go with that train whatever the weather. I did not think it necessary to slacken on account of the weather. I saw no light from the van of the coal-train, nor the coal-train itself, before striking it, which we did with full steam on. I was stunned, but I recollect the engine turning over, and then my getting off it. I was too much injured to make any observations after that. I got the fire out of the engine as soon as I could, with the assistance of my mate. I did not go into the signal-cabin, nor across the line, neither did I notice the signals. I have driven that train in my turn sometimes once and sometimes twice a week. I have noticed a train shunt, sometimes at Yaxley, sometimes at Holme, sometimes at Abbotts Ripton, but without knowing what train it was in regard to its number. I have never had a narrow escape of running into a coal train at Abbotts Ripton, and have not had conversations here (Huntingdon Infirmary) about such escapes. I have never said that near Abbotts Ripton or Holme, I have "brushed" that train. I have not mentioned it to anyone. I never notice what trains go up the Wood Walton bank in front of me. I did not know on the night of the accident that there was a coal-train in front of me which would have to shunt to let me pass. I reduced my speed once at Yaxley until I could see the signal. I could see the Holme distant-signal 500 or 600 yards, perhaps as far as usual on the night of the 21st January, but not so clearly as if there had been no snow. On an ordinary night I can see the Wood Walton distant-signal for three-quarters of a mile in passing Conington. On the night in question, I caught sight of it at about the same distance; the snow did not interfere with my view. It was snowing very fast, with big flakes.

Conclusion.

The circumstances connected with these two collisions have, in the course of the above evidence, been clearly brought out; but, in order that they may be better understood, it is necessary to select the principal facts, and arrange them in their proper order. It will then be more easy, in discussing the various questions involved, to deduce the

lessons to be learnt from so terrible an experience; bearing in mind that the paramount objects of such an inquiry are, not merely to ascertain what individuals amongst the officers and servants of a railway Company may be considered to be more or less implicated under the system of working in force, but also, and more especially, to determine the causes which have, directly or indirectly, and in a greater or less degree, led to the disaster, and, with the aid of all previous experience, the remedies by which, in practical railway working, such accidents may most surely be averted, and the public safety may best be secured.

The weather on the night of the 21st January was, between Peterborough and Huntingdon, and for some distance north and south of those places respectively, exceptionally severe. Between Ponton and Peterborough the telegraph-wires, coated with snow and ice to a thickness in some cases of three inches, fell down. The snow fell heavily, in large flakes, and in a condition to adhere to the substances on which it alighted. The storm, accompanied by a gale of wind, embracing a tract of country about 40 miles in breadth, and travelling generally in a north-easterly direction, after doing considerable damage on the Great-Western, the Midland, and the London-and-North-Western Railways, struck the Great-Northern Railway, perhaps, about 4.30 or 5 p.m., but at all events before 6 p.m., and lasted till midnight.

The first of these collisions occurred, as has been plainly seen, about 6.44 p.m., between an express-train, on its way from Edinburgh to London, and a coal-train which, having preceded it from Peterborough, was being shunted into a siding at Abbotts-Ripton to allow it to pass. The coal-train, consisting of an engine and tender, 33 loaded waggons, and a break-van, left New-England, on the north of Peterborough, at 5.53 p.m., 18 minutes late. The engine was late out of the shed, after being repaired and having its boiler washed out; and there was some further delay in starting the train, from the lines in the coal-yard being obstructed, from the points being clogged by snow, and in consequence of the weather. The coal-train, therefore, passed the Crescent-junction, on the south of Peterborough, where it joined the main-line, at 6.5 p.m., 21 minutes before the Scotch-express-train, and Holme at 6.21, 16 minutes before the Scotch-express-train. The Holme signalman, intending to shunt the coal-train at Holme, to avoid the risk of its delaying the express-train, kept his signals at danger, as he thought, against the coal-train; but he found that the engine-driver of that train, in running past his cabin, paid no attention to his signals, and he reported the circumstance to the station-master. The evidence as to what then happened at the Holme station was unsatisfactorily given, and is not clear; but it is certain that the Holme station-master, who knew from the report of his signalman that the signals at his station were prevented by the snow from working properly, and that the coal-train had run past them, and who might easily have inferred that other signals of vital importance to the safety of the traffic were likely to be similarly affected, saw and allowed the Scotch-express-train to pass at its usual speed through his station without taking any precautions in the way of warning the engine-driver; whilst the Holme signalman, not having the means of communicating by speaking-telegraph-instruments with the intermediate cabins at Conington and Wood-Walton, simply informed the Abbotts-Ripton signalman of the coal-train having run past his signals. The coal-train, after leaving Holme, passed the Conington cabin at 6.25, 13 minutes in advance of the Scotch-express-train, and the Wood-Walton cabin at 6.31, nine minutes in advance of the Scotch-express-train, and was stopped at 6.41 at Abbotts-Ripton, where it was timed, and the engine-driver expected to shunt, by a hand-lamp from the signal-cabin; and the signalman, keeping his own signals at danger, and not giving line-clear to Wood-Walton, instructed the engine-driver to set back into the up-siding. The coal-train, protected, as the Abbotts-Ripton signalman believed, by his own signals, and also by the Wood-Walton signals, was being pushed back, and had, excepting the engine, tender, and four or five waggons, got into the siding, when the signalman, knowing, from the information he had received by telegraph, what ought to be the position of the Scotch-express-train, told the engine-driver to make haste, in order to prevent the detention of that train at Wood-Walton. As he was thus endeavouring to hurry the engine-driver of the coal-train, the Scotch-express-train dashed, at 6.44, into the coal-train at full speed, and with the steam on; the engine-driver of the express-train having seen nothing but white lights at the Abbotts-Ripton and Wood-Walton signals, and having seen nothing of the coal-train before his engine came into collision with it. It was thus, in the first place, the failure to act of the fixed-signals at Holme, which caused the coal-train to pass that station, where there was 16 minutes to spare, and therefore time to shunt it without any risk of delay to the express-train; and, in the second place, the failure to act of the fixed-signals at Wood-Walton and Abbotts-Ripton, which deprived the coal-train of the protection which it

would otherwise, whilst being shunted at Abbotts-Ripton, have received from those signals.

As might naturally be expected, it took some little time for those who were concerned in this first collision to collect their ideas. The down-line as well as the up-line was hopelessly obstructed, communication from the north to the south of the débris was difficult, and the storm was very severe. The Abbotts-Ripton signalman is unable to give a clear account of his subsequent proceedings, but he appears to have at once placed the levers of his down-signals in the position of danger; and there can be no doubt, from the evidence of others on the same telegraph-circuit, that, commencing at 6.45, one minute after the collision, he vainly endeavoured from time to time to send a special message to Huntingdon, to report what had happened, and to ask for assistance. He did not, however, until eight minutes after this collision, or about 6.52, do what he ought to have done immediately after pulling over the levers of his down-signals, give five beats on his telegraph-bell, to indicate line-blocked, to the Stukeley cabin, 2 miles and 737 yards on the south of him; and as he was doing so—just too late—the down Leeds-express-train was passing that cabin. Meanwhile, a foreman-platelayer ran southward with fog-signals, two of which, according to his statement on the ground, he placed and saw explode, 98 yards south of the down-distant-signal, or 1,136 yards from the Abbotts-Ripton cabin, or rather more from the point of collision; and the fireman of the coal-train, in following him, placed two fog-signals, as he stated in his evidence 50 yards inside of the same signal, but as he pointed out on the ground 148 yards inside that signal—say 900 yards from the point of collision. A relief-clerk, also, who had been a passenger in the Scotch-express-train, after making his way to the south of the wreck, proceeded southward with the engine which had been detached by the force of the collision from the coal-train, in company with the guard of that train and others, to give warning and obtain assistance from Huntingdon. In nearing the down-distant-signal they met the Leeds-express-train, and they did their best, by opening the engine-whistle and exhibiting a red-light from a hand-lamp, to warn the engine-driver of that train. They saw some fog-signals explode before they reached the engine of that train, but it was of course impossible for them, under such circumstances, to point out their precise position when they did so.

Turning now to the Leeds-express-train, and the signal-cabins south of Abbotts-Ripton, it would appear that at 6.49, five minutes after the first collision, that train passed the Huntingdon south-cabin; and that the signalman in that cabin, who knew at 6.8 that his up home- and distant-signals were clogged, and at 6.34 that his levers were not working properly, was aware, at 6.47, (though he denies having noticed anyone *calling* until 6.57,) that the Abbotts-Ripton signalman was trying to send him a special message, which he did not accept until 7.5. At 6.52, also, eight minutes after the first collision, the Leeds-express-train passed the Stukeley cabin, 2 miles 737 yards from the Abbotts-Ripton cabin, still at full speed, at the moment when the obstruction-signal of five beats on the telegraph-bell was being forwarded along the wires from Abbotts-Ripton to Stukeley. Having seen nothing but white lights at the signals up to that point, and still believing all to be clear for him, the engine-driver of that train, who was doing his best to keep time, approached the Abbotts-Ripton distant-signal, which also showed a bright white light, at a speed of 40 or 50 miles an hour. He was driving a powerful engine, with a tender and 13 vehicles, of which three were break-vehicles, each containing a guard, behind it. He heard some fog-signals explode, about 60 yards, as he thought, after he passed the distant-signal. He saw the coal-engine travelling in the opposite direction, on the up-line, and the red light displayed from it. He did his best to bring his train to a stand, but he failed to do so until his engine came into collision with the débris of the first collision, at a speed believed by him and his fireman to be 15 or 20 miles an hour, but stated by other witnesses, including the guards of the train, to have been very much greater. And thus the second collision, with all its distressing consequences, occurred between 6.55 and 6.56, more than 11 minutes after the first collision; the special message above referred to, intended to report the first collision, and attempted, after a *calling* which began at 6.45, to be sent at 6.47, not having been accepted at the Huntingdon south-cabin until 7.5; the obstruction-signal having been forwarded from Abbotts-Ripton and received at Stukeley, as stated, at 6.52; and the Abbotts-Ripton down-distant-signal having still shown at 6.55 a bright white light, as if all were clear for the Leeds-express-train to run at full speed past the Abbotts-Ripton cabin.

Such being, generally, the circumstances which preceded and led to these two collisions, it will be desirable next to discuss the causes by which they were produced.

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... run past Holme, and
... signals at that station
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... afforded ample protection
... to danger in answer
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... whilst travelling on a
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... the signalmen and the engine drivers, which speak, in ... by night, to the engine-drivers in the ... "all right," or "danger," ceased to act. ... employed on all our railways, whether the block-system is in ... white lights when they ought to have exhibited ... the snow and the frost, by causing the arms and the wires to be ... the arms and the spectacles after being pulled off by means of the levers ... from going again to the positions of danger ... men, therefore, ... at Abbotts Ripton and at Wood Walton, seem ... thought,

from their cabins, with their signal-levers in the positions of danger, were unwittingly displaying white lights in place of red lights at their signal-posts to the engine-drivers; and such misleading signals were, in fact, far worse than no signals at all. If the lamps had gone out altogether, or had shown half white and half red, or had been visible for shorter distances, then it would have been the duty of the engine-drivers to treat them as danger-signals, or to approach them with caution; but, inasmuch as these lamps were showing bright white lights, they were the fatal means of saying all-right to the engine-drivers when there was imminent danger, and of inducing them, in the up and down express-trains, to keep on their steam, and maintain to the utmost of their power the high speed at which they were timed to travel, under the adverse conditions of weather to which they were subjected. The most subtle ingenuity could hardly devise means more misleading, or more certain of success, for luring the engine-drivers, with their trains loaded with precious human freight, forward to inevitable destruction. These signals, plainly indicating safety where there was so much danger, enticed, first, the engine-driver of the Scotch-express-train to pass the Wood-Walton cabin and to approach the Abbotts-Ripton cabin from the north at full speed, and to dash into the coal-train with his steam on; and, secondly, the engine-driver of the down-express-train to pass the Abbotts-Ripton distant-signal, on his way from the south, at such speed that he was unable, with the means at his disposal, on receiving warnings from fog-signals and from the men on the engine of the coal-train, in travelling, say 1,000 yards, to avoid the second collision and its terrible results.

These collisions thus occurred, then, not from any failure in the principle of block-working, but because the signals, as ordinarily used, with or without it, afforded misleading indications; and it is necessary to represent plainly and forcibly, and to dwell upon, these facts of the case, in order, not merely to assign to the collisions their true causes, but still more in order that the remedies and other considerations with a view to safe-working may be clearly understood. The questions which naturally arise out of them are, (1) in what respects the officers and servants of the company did or did not do their duty properly; (2), how far the apparatus of signalling or the mode of working may be improved; (3), whether it be wise under any circumstances to maintain so high a speed through such a storm; and (4), what additional means of precaution might under such circumstances be adopted.

As regards the servants of the Company with the trains, no blame whatever can be attached to them. The engine-driver of the coal-train ran forward properly to Abbotts-Ripton, on finding the signals at all-right for him to pass Holme, and he was doing his best to shunt into the siding at Abbotts-Ripton when the first collision occurred. The engine-driver of the Scotch-express-train, who was himself seriously injured, is much to be pitied, but certainly cannot be blamed, considering his instructions, his practice of working, and the obligations imposed on him as regards punctuality, for maintaining his speed when he found white lights at all the fixed signals, and received no warning of danger. The engine-driver of the Leeds-express-train, who was but slightly injured, was similarly misled by the down-distant-signal at Abbotts-Ripton, which showed a white light at 1,038 yards from the cabin; and was doing his best to keep time with his train under very disadvantageous circumstances, when he was suddenly warned, by exploding-signals, and by the men on the coal-engine, of impending danger. The rails were no doubt in a slippery condition. It is a question how far the middle and rear guards of the train afforded assistance to him in pulling up. He, no doubt, did what he could in the position in which he was placed, and no blame can properly be attached to him in regard to the second collision. But the station-master at Holme, who was informed by his signalman of the coal-train having run past the Holme signals when they were supposed to be at danger, and who found that the signals were affected by frost and snow, might, if he had displayed greater activity and a moderate amount of forethought and caution, have been the means of averting the first collision. He knew that, this first irregularity having been unwittingly committed, the coal-train could not then be shunted short of Abbotts-Ripton, and that it would have to precede the express-train up an incline of 1 in 200 before it reached the siding at that cabin. He could see what the weather was. He might easily have inferred that other signals along the line would be similarly affected. It is impossible to believe that he would have been found fault with, under such circumstances, by the superior officers of the Company for so obvious a measure of precaution. And be might fairly have been expected, as he could not communicate by telegraph with the Conington and Wood-Walton cabins, to exceed what he seems to have considered the rigid bounds of his duty, and the strict letter of his instructions, by stopping the Scotch-express-train, and

warning its engine-driver of the condition of the signals, and of the coal-train having gone forward to Abbotts-Ripton.

The signalman at Abbotts-Ripton was clearly in no way to blame for the first collision. It was not his fault that the coal-train, after running through Holme, came to shunt at his cabin so short a time before the Scotch-express-train reached him. He did his best to protect the shunting coal-train, by abstaining from giving line-clear to Wood-Walton, and by keeping his own signals at danger. But he evidently lost his presence of mind to some extent after the first collision, partly from the stunning effects of that collision itself, and partly, perhaps, from the difficulty he experienced when he tried, on his speaking-instrument, to report it to Huntingdon. He ought, undoubtedly, to have given the obstruction-signal, by five beats on his telegraph-bell, to the Stukeley cabin, at once after pushing over the levers of his down-signals to the position of danger. But he was seen to be calling Huntingdon south-cabin at 6.45, only one minute after the first collision, and if the message he then tried to send had been taken during the following three minutes, the second collision would not, probably, have occurred.

The evidence that this man, Johnson, the Abbotts-Ripton signalman, was endeavouring to telegraph to Huntingdon as soon as possible after the first collision, may be summed up as follows:—

The guard of the coal-train, Hunt, on going into the cabin to see if both lines were blocked, understood that such was the case, and that Johnson "was trying to attract attention, to telegraph an account of the accident." Simpson, a guard of the Scotch-express-train, re-lighted his lamp, went up to the signal-cabin, and found Johnson "busy with his telegraph-instruments." Blatch, a telegraph-clerk at Peterborough, who was waiting to telegraph a train at 6.45, then saw some one calling Huntingdon, and saw Abbotts-Ripton, having gained attention, offer an S.P. (special) message to Huntingdon at 6.47. And it was only on Huntingdon not accepting the S.P. message, and Abbotts-Ripton apparently ceasing in the attempt, that he then telegraphed a train at 6.50 to Holme, at 6.51 to Huntingdon (north and south cabins), and at 6.52 to Offord; so that Maddison, the signalman in the south-cabin, Huntingdon, who did not accept the S.P. message at 6.47, did, at 6.51, accept and receive a train-message. The signalman at the Crescent-junction-cabin near Peterborough, heard, about 6.50, from the telegraph-lad in the cabin, that Abbotts-Ripton was calling Huntingdon, and at 7 o'clock that "something must be the matter," as Abbotts-Ripton was sending an S.P. And the lad, Osborn, saw, about 6.52, that Abbotts-Ripton could not get Huntingdon's attention for two or three minutes. He attempted to use the instrument himself, but was stopped by Abbotts-Ripton with an S.P., and Abbotts-Ripton began again to call both Huntingdon and Peterborough. It cannot, therefore, be doubted that Johnson, though he ought sooner to have given the obstruction-signal of five beats on the telegraph-bell to Stukeley, did commence almost immediately after the first collision, and did persevere from time to time in his attempts to telegraph the accident to Huntingdon, and was mainly prevented by the signalman, Maddison, in the south-cabin, Huntingdon, from doing so till 7.5, 20 minutes after he began to call Huntingdon; and the same special message was finally dispatched by Bradshaw at 7.5, as it had been written by Johnson before Bradshaw reached the cabin at 6.58, when he found Johnson was still doing his best to send it.

The signalman at the Huntingdon south-cabin appears to be more deserving of censure than any other servant of the Company. He denies having been "called" from Abbotts-Ripton until 6.57. But the evidence of others on the same telegraph-circuit is clear. He must have known at 6.47 that the Abbotts-Ripton signalman, who began to call him at 6.45, was trying to send him a special message, with the prefix S.P., which would indicate something unusual and important, and which might be very urgent. He contented himself with delaying the transmission of this message more than once, by asking in reply for the code-time, and by returning M.Q., for "wait." He allowed the Leed-express-train to pass him at 6.49, at full speed; the instruments were employed meanwhile for other messages; and it was only at 7.5 that he accepted from Abbotts-Ripton this special message, with its code-time of 6.45, reporting the collision, and asking for assistance. His own excuse for not accepting it when it was first offered was because it did not commence with the code-time and the number of words, and was thus "unbusinesslike." If he had at once taken it, after seeing the important prefix S.P., as he ought to have done, he might, apparently, have been able to use his hand-lamp for stopping the Leeds-express-train near his cabin,—five minutes after the first, and six minutes before the second collision.

There were other precautions, also, by the use of which these collisions might have

been avoided, and to which it is important to refer. The signalman at Wood-Walton, not having received line-clear for the coal-train, which passed him at 6.31, and not knowing, even, whether it had reached Abbotts-Ripton, when he received be-ready at 6.35 for the Scotch-express-train, when he received train-on-line for it at 6.37, or when it passed him at 6.40, gave no warning, even with his hand-lamp, to the engine-driver. He could not see the condition of his signals, because the snow covered the windows of his cabin. He "thought, when the Scotch-express-train passed, that the coal-train would not be clear, because he expected it would be shunted at Abbotts-Ripton." He stated, first, that he "did not hear" the Scotch-express-train approaching, "on account of the wind," until it passed his cabin; and afterwards, when re-called, that he did not show a red light from his hand-lamp to the engine-driver, because he was "using the hand-lamp for drawing down a train of empties." But as he had received from the Conington-cabin, the be-ready signal for it at 6.35, and the train-on-line signal at 6.37, he knew precisely when it ought to be approaching his own cabin. Under his instructions, he ought to have placed fog-signals on the rails, to supplement his fixed-signals on such a night. This would, of course, have necessitated his leaving his cabin; but if he could not do so he might at least have been expected in such circumstances to use his hand-lamp in addition to his fixed-signals to warn the engine-driver, especially as he had experienced similar difficulties in regard to the working of his fixed-signals, and in daylight, on account of snow, in the previous December. He subsequently used his hand-lamp to stop the Manchester-express-train, when that train was running past his signals. The subject of the use of hand-lamps under such circumstances will be again referred to in a separate paragraph.

The platelayers, also, might have averted these collisions, if they had, in accordance with the printed instructions quoted in the appendix, attended to the signals, and ensured their working properly. But there were no platelayers in attendance at any one of these signals at the critical moment. Two platelayers went, indeed, to the Abbotts-Ripton cabin; and they were engaged, the one in reaching down fog-signals, previously to starting, at the signalman's request, for the down-distant-signal,—and the other in leaving the cabin, after having provided himself with fog-signals, for the up-distant-signal, when the first collision occurred. The storm came on, no doubt, at an awkward time as regards the duties of these men. They were finishing their day's work, and going home for their tea, about the time that it commenced; and when they left their tea, and were preparing, if necessary, for a night in the snow at the signals, it was too late. But the lesson to be learnt from such a state of things is a striking one. It is, on the one hand, difficult to blame men who, after a long and hard day's work, do not, on the commencement of a snowstorm, at once start, without their tea, in heavy snow, strong wind, and hard frost, for a night at the signals. But it is, on the other hand, sufficiently apparent, how great the risk that must be incurred, in attempting to conduct such traffic in the ordinary way, and to run express-trains at full speed, especially at the commencement of such a storm, and before the platelayers have had time to get to the signals, to knock the snow and ice from the arms and wires, and thus to keep them in working order.

In regard to the liability of fixed-signals to "stick" in such weather, there is the evidence of several of the servants of the company concerned in these collisions:—

Wilson, the engine-driver of the Leeds-express-train, who had at one time been a lad-porter, employed to light the signal-lamps, had frequently known the signals to stick in such weather. Murfitt, his fireman, has "known the signals to stick through the snow." Gammons, a platelayer, noticed, as the up Manchester-express-train passed Holme, that the distant-signal which ought then to have been turned to red, continued to show a white light; and, knowing that the snow might weigh down the arms, he watched the signal, to see whether it remained in the same condition after the passage of a stopping train which followed. He had seen the same result from snow previously, but not so badly, and "once before this winter." Rose, the signalman at Wood-Walton, found in December last, in the day-time, that his signals "would not work on account of snow." Trowell, the signalman at Stukely, having before had trouble of the same sort, and being "suspicious because of the weather," sent a man to see whether his down-distant-signal was working properly. Pallinder, the signal-fitter at Huntingdon, had "very often found "that signals would not work in snowy weather, but had on previous occasions been "able to free them by working the balance-weights. Last December he had to clear "the snow off the signals at Huntingdon, Holme, Yaxley, and Fletton, because they "were all more —

" the signals themselves.

onstructed, with some varieties as

regards the details, so as to be worked from a greater or less distance, by means of levers or wheels in or near the cabins, wire-connections running over metal pulleys, balance-weights on the signal-posts, and rods running up the posts. When a lever is pulled forward, the wire is strained, the balance-weight is lifted, and the semaphore-arm is drawn down to a vertical position in the post, at the same time that the red glass or spectacle is withdrawn from the front of the signal-lamp. When the lever is pushed back again, the balance-weight at the post is depended upon, in falling, to draw the slack-wire through the pulleys, and to cause the semaphore-arm to return to the horizontal position, at the same time as the red glass or spectacle covers the white light of the lamp. The present arrangements for fixed-signals have come into general employment, mainly on the semaphore system, on account of their simplicity and general efficiency; and the balance-weight at the post has been preferred as a means of causing the signal to return to danger, because there is not, in the event of a wire stretching or breaking, the risk of the signal remaining at all-right, and giving a wrong indication. On the other hand, when there is undue friction through the pulleys, round curves, or against intermediate objects, the balance-weight is sometimes insufficient for its duty; and it will readily be understood that when ice or snow overloads the semaphore-arms, coats the wires, already contracted by cold, and interferes with the action of the pulleys, the signals, and especially those worked at great distances from the cabins, may too easily be rendered inefficient. The signals are, as far as possible, kept within sight of the cabins, or, if they are not visible from the cabins, electric or other repeaters are supplied to record their working, and to inform the signalman whether the arms and glasses are working by day or by night, and also, in many cases, whether the lamps are burning by night. But it is obvious that during fogs and heavy snowstorms the signalmen cannot observe the working of their signals as they are expected to do in clear weather.

Such being the ordinary conditions of signal-working, the experience of the present accident naturally leads to many reflections as to how they might be improved. For instance, the wires might be covered for the whole of their lengths, and protected from extreme changes of temperature, and from snow; the home-signals might be worked, as is already done in many cases, by rods in place of wires, which would enable the signalmen to shake the snow from them; and the distant-signals might be worked by double (endless) wires, as they have been, especially on the broad-guage system of railways, in addition to balance-weights; and all signals might be furnished with repeaters in the cabins. Then, again, they might be kept, as a rule, at danger, and only lowered to all-right when trains are telegraphed or expected, in which case they would be less easily, and less dangerously, affected by snow than when they are kept more constantly at all-right. And on this point it may be observed that a signal stuck in the position of danger would only cause delay, whilst a signal stuck in the position of all-right may, as is too clearly evident from the present case, become a source of frightful danger. It is well that these and other proposals for improvement, which are constantly invented or advocated, such as combining sight with sound at the signals, and the use of detonators, mechanically applied, to supersede the use of fogmen, should receive full consideration and discussion, after the experience of so terrible an accident, caused mainly by the failure of existing signal-arrangements. But, in the course of such deliberations, the facts must not be lost sight of, that men are still liable to make mistakes, machinery is still liable to fail, and further complication is by no means certain in all cases to produce greater safety. Great progress has been made of late years in perfecting the apparatus employed, and further progress may be made. But it must be done cautiously, and, as heretofore, by the light of experience, as to what is really found in practice to conduce to safe and convenient working. It is not wise to prove too much from a single case, but the lessons of this must be taken in combination with those of other accidents, in indicating the directions in which further improvement may be effected.

As regards the regulations for block-working, it will have been observed that the Abbotts-Ripton signalman did not give line-clear to the Wood-Walton signalman before the first collision occurred, and that if the fixed-signals had not failed to act, the shunting coal-train would thus have been protected by the Wood-Walton as well as by the Abbotts-Ripton signals. But in ordinary weather line-clear would, in accordance with the printed regulations, have been given from Abbotts-Ripton to Wood-Walton, whilst the coal-train was still shunting on the north of the Abbotts-Ripton cabin. Under a method of block-working, the interval of space between trains becomes redu the short distance (68 yards in this instance) between the shunting train and the signal-post; and sometimes, as I have had occasion to point out recently, in the

two collisions on the Midland Railway, to the thickness, so to speak, of the signal-post. It is obvious that the advantages supposed to be derived from the block-system, by insuring intervals of space between trains, must, under such circumstances, be more or less nullified, and that the block-system so worked becomes only a delusion and a snare, leading to the belief that absolute safety is provided when there is constant risk. And inasmuch as collisions are very much more frequent between running trains and shunting trains than between running trains following one another, the system thus becomes weak where it most requires to be strengthened.

The printed regulations issued for the guidance of the Company's servants during "fogs and snowstorms," Appendix A, will properly receive special attention with reference to these collisions. In those regulations it is provided (par. 2), that when "*fixed signals cannot be seen at a distance of* 150 *yards, a platelayer to act as* "*fog-man must be placed at each distant-signal, and one must also be placed near* "*the signal-box of each junction to assist the signalman;*" (par. 3), that "*it is* "*not necessary to place fog-men at the home or distant-signals of any block-signal-box* "*which is not at a station or junction*;" and (par. 13), that "*signalmen at intermediate* "*boxes must be provided with detonators, and in foggy weather or a snowstorm must, as* "*far as practicable, keep two detonators on the rails when the home-signal is at danger.*"

It will be seen that the platelayers were not required by these regulations to attend under any circumstances (par. 3) at the signals of the Conington or Wood-Walton cabins, nor (par. 2) at the Holme or Abbotts-Ripton cabins so long as the signal-lamps were visible for 150 yards; and that in these regulations the contingency of the signals requiring attention from the platelayers during a snowstorm, in order to provide against their ceasing to act, or acting imperfectly, is not contemplated. But the regulations did require (par. 13) that the signalmen at the Conington and Wood-Walton cabins should, *as far as practicable*, keep two detonators on the rails when their home-signals were at danger. In order, however, to carry out this last provision, it would be necessary for the signalmen to leave their levers, their instruments, and their cabins, and to go down upon the line during such a storm, whenever their home-signals were at danger; and this is one of a class of rules that is hardly likely, from the difficulty of the case, always to be obeyed. If, on the other hand, the signalman were enjoined to exhibit during snowstorms their flags by day, and their hand-lamps by night, from their cabins, to confirm the indications of their fixed-signals, there would not be the same excuse for disobedience; and the indications thus afforded would be most useful to the Company's servants with the trains. The raised signal-cabins, as now constructed, with glazed fronts and sides, are conspicuous objects, especially when lighted up during the hours of darkness; and they are the objects to which the engine-drivers and guards naturally look in passing for guidance, especially whilst travelling at high speed. Although hand-signals employed at the cabins to wave the engine-drivers past fixed-signals at danger are for many reasons objectionable, hand-signals exhibited in confirmation of the fixed-signals would be always valuable, as a guarantee to the engine-drivers, both of the proper working of the fixed-signals, and of the care and attention of the signalmen. It would, of course, be impossible, when the traffic is constant, and trains are liable frequently to pass at the same time in both directions, for the signalmen in all cases to employ their hand-signals in addition to their fixed signals, and it is not necessary that they should do so; but the practice might with advantage be adopted more frequently, and especially when the signalmen are unable to see, as in a heavy snow-storm, whether their fixed-signals, unfurnished with repeaters, are working properly. It is impossible, at all events, to avoid the reflection, with reference to the present case, that if the Holme signalman had, as the Abbotts-Ripton signalman did, shown a red-light from his hand-lamp to the engine-driver of the coal-train, (who knew that he would in the event of the Scotch-express-train running punctually have been stopped there), the coal-train might thus have stopped and shunted safely out of the way at Holme; and if the Wood-Walton signalman had employed his hand-lamp, in confirmation of his fixed-signals, to warn the engine-driver of the Scotch-express-train, the first collision would in all probability have been avoided, and the second would not then have occurred. The Manchester-express-train following the Scotch-express-train was, in fact, as already referred to, stopped, as the Scotch-express-train might have been stopped, by a red-light from the hand-lamp of the signalman at Wood-Walton; in obedience to which the engine-driver, after finding white lights at the distant-signals, and passing the Wood-Walton cabin at a speed of 40 miles an hour, brought his train to a stand at the down-distant-signal beyond that cabin; and the Conington signalman employed the same means to stop a slow-passenger-train at 7.10, when, not having got line-clear from Wood-Walton, he observed it approaching him, after passing white lights at the signals, at too high a speed.

It would not therefore, be unreasonable, and it is important, to require, especially in such weather, if detonating signals cannot be put down in compliance with the above regulations, that this simple precaution, of employing hand-signals, should at all events be adopted.

But whatever may be done in these respects, and however perfect signal-arrangements may be made, the further question must remain as to whether it is reasonably safe or justifiable to attempt to conduct the traffic as usual, and to run at high speed through heavy snow-storms and thick fogs. This is a question to which I have necessarily referred in regard to previous accidents in reports to the Board of Trade, and which has received much illustration in the evidence on the present case. The engine-drivers with the express-trains in this country, running through for long distances, have no time to spare in average weather and ordinary conditions, if, even, they are not at times compelled to run some risks in order to maintain punctuality. An insight may be obtained by a careful perusal of the above evidence of the dangers that are encountered in endeavouring to keep up the same rate of speed in a snowstorm. The platelayers, after their day's work, go home to their tea, and sally forth for a night, to be spent in clearing the points of snow, or doing duty at the fixed-signals, which they reach too late, unfortunately, to prevent them from misleading the engine-drivers; and which they find it impossible in some cases, after they reach them, to keep in working order. The signalmen, with the windows of their cabins frozen, and the glass covered with snow, are unable to look out, or to see far, and discover only by trains running past their cabins that the fixed-signals on which they rely for stopping them must be giving false indications. The engine-drivers, with the glasses in their weather-boards covered with snow, but keeping the best look-out they can, see only bright white lights, encouraging them to keep up their speed, when they ought to see red lights to warn them of danger ahead. The guards in attempting to clear the snow from the windows provided in their vans to enable them to keep watch along their trains and look ahead, find it accumulating faster than they can get rid of it. A station-master to whom it is reported that a train has run past his station whilst the signals are supposed to be at danger, who finds that the signals are prevented by the snow and frost from working properly, and who might have known at once that other signals on the line would be similarly affected, allows the Scotch-express-train to run through his station at its usual speed, and either cares not or dares not, by interfering with its onward course, to give the much needed warning to its engine-driver. The down-express-train, in spite of warning at 1,000 yards from the site of a previous collision, cannot be stopped, but is still running at high speed at the end of that distance. The bare enumeration consecutively of these conditions is sufficient to give some idea of the dangers that are and must be encountered in attempting to keep up the full speed of express-trains in such a storm,—dangers that were not previously unknown, and that no degree of perfection in system, apparatus, or discipline can be expected altogether to obviate. Taking a practical view of human nature, and remembering that railway-servants are as other men, and are without too many suits of clothes, or a superabundance of waterproof materials, an idea may also be obtained of the difficulties under which they are expected to perform out-door duties in a storm which may cause them to be wet through in a few minutes. And it is next to impossible to provide that the many extra precautions which may under such conditions be required shall always be supplied with absolute certainty, at every cabin and every signal, in readiness for a sudden emergency on a long line of railway.

There is, however, one improvement which may with advantage be introduced, as to the desirability of which there can be no doubt, which has formed a frequent subject of recommendation to the railway Companies, and the application of which would no doubt have prevented the second collision, with all its terrible consequences, from occurring. Continuous-breaks in the hands of the engine-driver of the Leeds-express-train would have enabled him easily, after the warnings that were given to him, to bring his train to a stand within the distance allowed. And this appeared so important a feature in the case, that it became desirable to request the Company to allow of some experiments being made on the subject. The Company were good enough, accordingly, to provide two trains, one fitted with continuous-breaks, such as they had previously prepared for experiment before the Royal Commission on Railway Accidents, and the other as nearly as could be arranged in the same way as the Leeds-express-train. The results of those experiments will be found in the Appendix, from which it will be observed that the first three trials were made with the vacuum-break-train, which w stopped by the aid of continuous-breaks, on a falling gradient of 1 in 200, when tra ling at 45 miles an hour, in one case in 410 yards of space and 26 seconds of time. another case in 451 yards and 30 seconds; whereas the same train, with thre

breaks and the tender-break applied, at a speed of rather less than 41 miles an hour, was only pulled up in 631 yards and 44 seconds. It appeared possible, with reference to the last-mentioned but first-tried experiments, that some of the break-blocks might not be quite free of the wheels; and the three next trials, with hand-breaks only, were made with a train differently composed, as shown in the Appendix. The object of these trials was to give an idea, as far as could be obtained under a totally different condition of the rails, as to what might have been done proportionately on the night of the accident,—(1), if the engine-driver of the Leeds-express-train had been assisted by all the guards in the train, and (2), if he had, from the first warning he received, done his best to pull up, wholly or partially unassisted by the middle and rear guards. These three trials were all on a falling gradient of 1 in 200, and the distance of pulling up varied, under the conditions stated in the Appendix, from 795 to 1,125 yards of distance, and from 55 to 70 seconds in time. On the night of the accident, the rails having been much more slippery, all of the distances above mentioned would, of course, have been materially increased.

The proportion of break-power employed on the Leeds-express-train on the 21st of January—three break-vehicles (besides the tender-break) to 13 vehicles,—was, perhaps, as much as can in practice be expected without a system of continuous-breaks, and was more than is frequently employed. But the defect of the system of hand-breaks worked by separate guards in different parts of the train is well known, and has often been stated. The guards near the middle or end of a train are frequently unable to hear the break-whistle, and the engine-driver is thus unable to obtain their assistance when he most needs it. It appears from the evidence of two of the guards of the Leeds-express-train that they did not on this fatal night hear any fog-signal explode or the break-whistle from their own engine, though they state that they heard and saw the engine of the coal-train; but it is by no means certain how much assistance they gave towards stopping their train before the second collision occurred, as they thought, at a speed of 30 or 40 miles an hour. If, on the other hand, the power of readily applying break-blocks to every wheel of the train, by means of the vacuum or any other good system of continuous-breaks, had been in the hands of the engine-driver, he would have been able, after going over the fog-signals and seeing the coal-engine, without doubt or difficulty, to have brought his train to a stand far short of the débris of the first collision.

On a general review of the case, the causes, direct or indirect, of the first collision may thus be summed up:—

1. The late departure of the coal-train from Peterborough, which prevented it from reaching and being shunted at Abbotts-Ripton before the approach of the Scotch-express-train.

2. The failure to work, during a heavy snow-storm, of the signals at Holme, which prevented the coal-train, running late, from being stopped and shunted at Holme, as intended by the signalman, out of the way of the Scotch-express-train, and without the risk of danger or delay to that train.

3. The want of judgment and precaution exhibited by the station-master at Holme, who might otherwise, after the report made to him by the signalman, and on finding the effect produced by the snow upon his own signals, have inferred that other signals were similarly affected, and have taken measures to warn the engine-driver of the Scotch-express-train, and to prevent him from being deceived by them.

4. The absence of telegraph-speaking-instruments in the signal-cabins at Conington and Wood-Walton, by means of which the signalmen in those cabins might have been informed of the coal-train having run past Holme contrary to the intention of the Holme signalman, and have been warned of the probable condition of their signals.

5. The action of the snow and ice upon the signals at Wood-Walton and Abbotts-Ripton, in preventing them from responding to the action of the levers in the signal-cabins, and in thus causing them to be, not only useless for warning by red-lights the engine-driver of the Scotch-express-train, but also a means by the exhibition of white lights of luring him forward at full speed to the collision.

6. The neglect of the Wood-Walton signalman, who did not either obey par. 13 of the printed regulations applying to "fogs and snow-storms," requiring him, in such weather, to put detonators on the rails, as far as practicable, when his home-signal was at danger, or even employ his hand-lamp to give warning to the engine-driver of the Scotch-express-train.

7. The absence of the platelayers or "fog-men" from the signals at the critical moments, when they were so much required, either to clear the signals of snow and to cause them

to work properly, or else, if they could not ensure their efficient working, by means of detonating-signals, to warn the engine-drivers of the trains.

8. The running of fast-through-trains at full speed through such a storm, described as having been the most severe ever known in that part of the country, without the adoption of extra precautions, such as the detention of slower trains, the use of hand-lamps in the signal-cabins, and the employment of platelayers at the signals.

And the causes which operated more particularly in producing the second collision were :—

9. The want of notice, until eight minutes after the first collision, from the Abbotts-Ripton cabin to the Stukeley cabin, by five beats on the telegraph-bell, of the obstruction on the down-line caused by the first collision.

10. The delay of the signalman at the Huntingdon south-cabin in accepting the special-message which the Abbotts-Ripton signalman, who commenced to call at 6.45 p.m., endeavoured, after obtaining his attention at 6.47 p.m., to send him, to report the collision and ask for assistance; which special message the Huntingdon signalman might otherwise have received in time to admit of his stopping the Leeds-express-train, and preventing the second collision.

11. The failure to act of the down-distant-signal worked from the Abbotts-Ripton cabin, which continued to show a white light when the engine-driver of the Leeds-express-train passed it, nearly eleven minutes after the first collision.

12. The want of continuous-breaks in the hands of the engine-driver of the Leeds-express-train, to enable him to avoid the second collision, which was the occasion of so much loss of life, after receiving notice from detonating-signals, say 1,000 yards from the site of it, and immediately afterwards from the men on the engine of the coal-train, of something being wrong.

The most important remedies to be considered with a view to the avoidance of such collisions are :—

1. Improvement in the apparatus of fixed-signals, to prevent them as far as possible from becoming inefficient during frost and snow, and to cause them to afford indications to the signalmen when they cease working, or are not working properly.

2. Improvement in the working of fixed-signals, by keeping them habitually at danger instead of at all-right, so as to render them less liable to *stick* in the more dangerous position of all-right.

3. Improvement in the printed regulations for the guidance of station-masters, inspectors, engine-drivers, signalmen, and platelayers, as to their duties during "fogs and snow-storms."

4. Careful supervision in regard to the working of fixed-signals at intermediate, as well as at the principal block-cabins, during snow-storms.

5. The employment by the signalmen of hand-lamps, especially in severe weather, in confirmation of the indications of their fixed-signals.

6. The provision and employment of speaking-telegraph-instruemnts in all the cabins.

7. The temporary stoppage of less important traffic, and the reduction of the speed of fast trains during severe snow-storms, when it is more difficult for engine-drivers and guards to keep a good look out, for signalmen to see out of their cabins, for platelayers to keep the fixed-signals in efficient working order, and for all the out-door officers and servants of railway companies to perform their duties satisfactorily.

8. The employment of continuous-breaks, by means of which the trains can be brought to a stand, on warnings of danger being received, within more moderate distances, by the action of the engine-drivers, without trusting to the guards, who are frequently unable in cases of emergency to hear the break-whistle from the engine, and who cannot therefore be relied on to co-operate with the engine-drivers when their assistance is most required.

9. The construction of an additional line of rails, already in contemplation, for slow traffic up the Conington Bank.

It is no more than an act of justice to acknowledge, in concluding this report, that the Great-Northern Railway Company has always borne a deservedly high character for the labour, care, and expense which have been bestowed on its signal-arrangements, and in regard to other means which have been provided with a view to the safe and punctual running of fast-through-trains. It might reasonably have been supposed, before the [illegible] these collisions, that if the fixed-signals of any Company were unlikely to [illegible]y it would be those on the Great-Northern Railway. But the example [illegible]es thus the more striking, and it serves the more strongly to inculcate [illegible]ly to be derived from these sad events, namely, that the attempt to

APPENDIX.

APPENDIX A.

Re-issue of Circular No. 617A.

The Great Northern Railway.

Fogs and Snowstorms.

In foggy weather, when the arms of the semaphore-signals cannot be seen plainly, the signal-lamps must be kept burning by day as well as by night.

When, from fog or snowstorm, fixed signals at stations and junctions cannot be seen at a distance of 150 yards, a platelayer to act as fogman must be placed at each distant-signal, and one must also be placed near the signal-box of each junction to assist the signalman.

It is not necessary to place fogmen at the home or distant-signals of any block signal-box which is not at a station or junction.

Each fogman must be provided with a hand-lamp, a set of flags, and with 24 detonating or fog-signals.

The fogman stationed at the distant-signal is required to keep two detonators on the rails whenever the fixed signal is at danger, but the detonators must be removed from the rails when the fixed signal is at "all right."

The fogman at the junction will act under the instructions of the signalman, and will assist in bringing trains in as may be ordered by the signalman. He will take care to have three detonators on each line of rails when the home-signal for such line of rails is at danger.

At a junction with a foreign line the Great Northern Company's fogmen must be placed on the lines which are maintained by the Great Northern Company; thus, at Marsh Gate, Doncaster, where lines from London, Leeds, York, and Thorne form the junction, the Great Northern Company's fogmen must be placed at the junction to assist the signalman and protect the traffic at the fouling-points of the lines, because the junction is maintained and worked by the Great Northern Company. Great Northern fogmen must also be placed at the distant-signals on the London, Leeds, and York lines of this junction, these being maintained by the Great Northern Company; but on the Thorne line, which is maintained by the Manchester, Sheffield, and Lincolnshire Company, that company must provide fogmen for the distant-signal and repeater.

In case of fog or snowstorm the clerk in charge of the station, or the signalman in charge of the junction, must require the attendance of platelayers to act as fogmen.

The inspectors of permanent-way of the respective districts are instructed to select men to act as fogmen, and these men will go to the signals in case of fog or snowstorm, even if not summoned by the clerk in charge or signalman. This will not relieve the clerk in charge or signalman from the responsibility of sending for the platelayers. The inspectors of permanent-way will arrange for relief men should the fog or snowstorm continue.

The clerks in charge are required to agree with the inspectors of permanent-way upon the platelayers to be sent for to act as fogmen, and the address of these men must be kept posted at the respective stations and signal-boxes.

A supply of hand-lamps and detonators must be kept at the several stations and junctions for the fogmen.

Referring to the regulations for block working, trains must not during foggy weather, nor in a snowstorm, be considered as "out" until the last vehicle has passed the home-signal post, and is continuing its journey, and has passed out of sight of the signalman.

Signalmen at intermediate boxes must be provided with detonators, and in foggy weather or a snowstorm must, as far as practicable, keep two detonators on the rails when the home-signal is in danger.

Enginemen and firemen must keep a good look-out for signals, and in case of fog or snowstorm, or when from any cause the fixed signals are not visible as soon as usual, the speed must immediately be reduced, so that the enginemen may be able to stop the train before reaching the fixed signals.

When a detonator is run over at a distant-signal, the engineman must immediately bring his train under perfect control, as provided by Section 68 of the Rules and Regulations for enginemen and firemen.

When a detonator is run over at a home-signal or near a junction, the train must be stopped with the least possible delay.

Attention is called to the following general regulations:—

"The absence of a signal at a place where a signal "is ordinarily shown, or a signal imperfectly exhibited, "is to be considered as a danger-signal, and treated "accordingly."

P. Stirling, Locomotive Engineer.
R. Johnson, Engineer.
Francis P. Cocksbott,
Superintendent of the Line.

London, King's Cross Station,
December 1872.

Circular 456A, dated 21st January 1871, is hereby cancelled.

conduct heavy railway-traffic as usual, and to run express-trains at full speed, through heavy snowstorms, must be attended with very serious risk, even though the best known means of safety in common use be provided. There can be no doubt of the advantages of punctuality in ordinary railway working. It is a good test, in one sense, of efficient management, and habitual unpunctuality is inexcusable. But occasional unpunctuality, which is in practice unavoidable, ought not to be the excuse for an accident, and even punctuality may be purchased at too dear a price. It would be far better to submit to the temporary stoppage of certain trains, and a reduction of speed of other trains, during such exceptional weather, than, in attempting to maintain punctuality with very fast trains, to incur serious risk of such collisions.

I have, &c.
H. W. Tyler.

The Secretary,
(*Railway Department,*)
Board of Trade.

I concur in the above report.
Charles Bowen.

APPENDIX.

APPENDIX A.

Re-issue of Circular No. 617A.

THE GREAT NORTHERN RAILWAY.

Fogs and Snowstorms.

In foggy weather, when the arms of the semaphore-signals cannot be seen plainly, the signal-lamps must be kept burning by day as well as by night.

When, from fog or snowstorm, fixed signals at stations and junctions cannot be seen at a distance of 150 yards, a platelayer to act as fogman must be placed at each distant-signal, and one must also be placed near the signal-box of each junction to assist the signalman.

It is not necessary to place fogmen at the home or distant-signals of any block signal-box which is not at a station or junction.

Each fogman must be provided with a hand-lamp, a set of flags, and with 24 detonating or fog-signals.

The fogman stationed at the distant-signal is required to keep two detonators on the rails whenever the fixed signal is at danger, but the detonators must be removed from the rails when the fixed signal is at "all right."

The fogman at the junction will act under the instructions of the signalman, and will assist in bringing trains in as may be ordered by the signalman. He will take care to have three detonators on each line of rails when the home-signal for such line of rails is at danger.

At a junction with a foreign line the Great Northern Company's fogmen must be placed on the lines which are maintained by the Great Northern Company; thus, at Marsh Gate, Doncaster, where lines from London, Leeds, York, and Thorne form the junction, the Great Northern Company's fogmen must be placed at the junction to assist the signalman and protect the traffic at the fouling-points of the lines, because the junction is maintained and worked by the Great Northern Company. Great Northern fogmen must also be placed at the distant-signals on the London, Leeds, and York lines of this junction, these being maintained by the Great Northern Company; but on the Thorne line, which is maintained by the Manchester, Sheffield, and Lincolnshire Company, that company must provide fogmen for the distant-signal and repeater.

In case of fog or snowstorm the clerk in charge of the station, or the signalman in charge of the junction, must require the attendance of platelayers to act as fogmen.

The inspectors of permanent-way of the respective districts are instructed to select men to act as fogmen, and these men will go to the signals in case of fog or snowstorm, even if not summoned by the clerk in charge or signalman. This will not relieve the clerk in charge or signalman from the responsibility of sending for the platelayers. The inspectors of permanent-way will arrange for relief men should the fog or snowstorm continue.

The clerks in charge are required to agree with the inspectors of permanent-way upon the platelayers to be sent for to act as fogmen, and the address of these men must be kept posted at the respective stations and signal-boxes.

A supply of hand-lamps and detonators must be kept at the several stations and junctions for the fogmen.

Referring to the regulations for block working, trains must not during foggy weather, nor in a snowstorm, be considered as "out" until the last vehicle has passed the home-signal post, and is continuing its journey, and has passed out of sight of the signalman.

Signalmen at intermediate boxes must be provided with detonators, and in foggy weather or a snowstorm must, as far as practicable, keep two detonators on the rails when the home-signal is in danger.

Enginemen and firemen must keep a good look-out for signals, and in case of fog or snowstorm, or when from any cause the fixed signals are not visible as soon as usual, the speed must immediately be reduced, so that the enginemen may be able to stop the train before reaching the fixed signals.

When a detonator is run over at a distant-signal, the engineman must immediately bring his train under perfect control, as provided by Section 68 of the Rules and Regulations for enginemen and firemen.

When a detonator is run over at a home-signal or near a junction, the train must be stopped with the least possible delay.

Attention is called to the following general regulations:—

"The absence of a signal at a place where a signal "is ordinarily shown, or a signal imperfectly exhibited, "is to be considered as a danger-signal, and treated "accordingly."

P. STIRLING, Locomotive Engineer.
R. JOHNSON, Engineer.
FRANCIS P. COCKSHOTT,
Superintendent of the Line.

London, King's Cross Station,
December 1872.

Circular 456A, dated 23rd January 1871, is hereby cancelled.

APPENDIX B.

GREAT NORTHERN RAILWAY.

REGULATIONS FOR TRAIN-SIGNALLING BY BLOCK TELEGRAPH.

Diagrams of Instruments.

Up Line.

Down Line.

General Instructions.

1. The needle of the instrument must always indicate the state of the line it represents, and be pegged over to "train on line" or to "line clear," as the case may be.

2. BELL SIGNALS.

To call attention	-	One beat of the bell.
Be ready	-	Two beats of the bell.
Line blocked	-	Five "
Stop and examine train	-	Six "

Upon hearing the bell the signalman must immediately look at the instruments on the section ringing, and be prepared to receive the dial signals.

3. DIAL SIGNALS.

Passenger train on line	-	Two beats of needle to left.
Goods or cattle "	-	Three "
Mineral or ballast train - "	-	Four "
Light engine "	-	Four "
Line blocked	-	Five "
Line clear of passenger train	-	Two beats of needle to right.
" goods or cattle train		Three "
" mineral or ballast train -		Four "
" light engine -		Four "
Line cleared	-	Five "

4. The process of signalling a train is as follows :—

On the approach of a passenger-train to station A., the signalman will call the attention of station B., and give two beats of the needle to the left hand. Station B. will repeat this signal, peg the needle over to "train on line," and give the be ready signal (as in clause 2) to station C. When the train approaches B., it must be similarly signalled to C., where the signalman will, in like manner, forward the be ready signal to station D. When the train has passed B., the signalman at B. must call the attention of station A., give two beats of the needle to the right hand, which A. will repeat, and peg the needle over to "line clear." Until the signal "line clear" has been received from station B., no train or engine must be allowed to depart from station A. (except as ordered in clauses 17 and 21 of these Regulations), nor must the line at B. be obstructed after the signal "train on line" has been received.

5. Trains are to be considered "out" and the signal "line clear" must be given to the station in the rear immediately the last vehicle has passed the station home-signal post, except as provided for by clauses 6 and 7.

6. Where the line is on a "falling gradient," the "line clear" signal must not, in the case of a train or engine that has stopped, be given to the station in the rear until such train or engine is again in motion and proceding on its journey.

7. During foggy or snowy weather the signal "line clear" must not be sent to the station in the rear until the train or engine that has stopped at the station has passed the home-signal and is proceding on its journey, or has been shunted into a siding clear of the main-line.

8. Should an unusual time elapse after the signal "train on line" has been received, without the train so signalled coming in sight, the signalman must place at "danger" the signals controlling trains approaching in the opposite direction, and having stopped the first engine or train he must verbally inform the engineman and guard the reason, directing them to proceed cautiously, and to be prepared for emergency.

9. No dial signal is, under any circumstances, to be considered as understood until it has been repeated back to the station from which it was received.

10. Before the line is blocked for shunting or other purposes, protection must be secured as follows :—

If the up-line be required, five beats of the bell must be given to the station next below. If the down-line, the bell must be similarly rung to the station next above. When the needle has been unpegged, five distinct ticks of the needle to the left hand must be given by the forwarding station; the same number of ticks must be repeated by the receiving station. The needle must then be fixed to "train on line."

As soon as the obstruction is removed the bell must be rung again, and five ticks of the needle to the right given and repeated, and the needle fastened over to "line clear."

If it be required to obstruct both up and down-lines, notice must be similarly sent to the stations in each direction.

11. The signal "stop and examine train" is only to be used in the event of a signalman observing anything unusual during the passage of a train past his station, such as a broken axle, vehicle on fire, hot box, &c., &c. Any signalman receiving such signal must immediately place at danger the signals controlling the line on which the train is approaching. Having done so, he must repeat the signal back to the station from whence it was received.

12. When a train has become divided, and is running on a falling gradient, the front portion must not, when the line is clear for it to proceed beyond the signals, be stopped, so as to risk its being overtaken by the second part, but when such train is running on a rising gradient, or where the line is perfectly level, the first portion must be stopped, and shunted into a siding as expeditiously as circumstances will permit.

13. Signalmen must in all cases carefully watch

each train as it passes, and satisfy themselves that the whole of the train has passed, and that the line is free from obstruction before giving the signal "line clear" to the station in the rear. They must also be particular to observe whether the last vehicle carries a red notice board by day or an additional tail lamp by night, as an indication that a "special train" is following.

14. In the event of a second engine or train arriving at a signal station before the preceding train or engine has been telegraphed as having passed the station in advance, it must be brought to a stand by the signals being kept at danger; the engineman must then be told to draw the tail of his train within the signals, and there await further orders. Such train must not again be started until the guard or engineman receives verbal instructions from the signalman to that effect.

15. Should an engine or train pass a signal station after dark without tail lamps on the last vehicle, the signalman must, immediately he has forwarded the signal "train on line," if such train be travelling on a level line or a rising gradient, at once give the signal "stop and examine train," If, however, the train be running on a falling gradient, the signal "stop and examine train" must not be used. He must not telegraph "line clear" to the station in the rear, but must call such station in the usual manner, and on gaining attention, must give seven ticks of the needle to the left hand. This signal having been acknowledged, he will again block the needle over to the words "train on line," the signalman at the rear station will thereupon stop any train or engine following, and verbally instruct the engineman to proceed cautiously towards the station in advance, informing him why it is necessary that he should do so. As soon as such train or engine has passed the signal station from whence the caution signal was received, the signalman there will recommence signalling in the ordinary manner.

16. No obstruction must, under any circumstances, be allowed on the down main line after "train on line" has been received from the down station in rear, nor must the up main line be obstructed after "train on line" has been received from the up station in rear.

17. If a needle suddenly becomes vertical, and no action takes place on moving the handle of the instrument either to the right or the left, it is an indication that the telegraph is broken down. Under such circumstances no other train or engine is to be allowed to proceed on that section of the line until it has been stopped, and the engineman and guard cautioned to go forward at reduced speed, so as to be prepared to stop at any moment, should it be necessary to do so.

18. The signalmen on giving a signal must see that their needles are firmly and completely blocked over; and when the needles are blocked over at the opposite end of the section, they must keep the pins out of the handles of their instruments and see that the handles are perfectly perpendicular.

19. The needles and bells must not be worked quickly, but each movement must be made slowly and distinctly.

20. The block instruments must not under any circumstances be used for conversing.

21. Guards must not rely upon the telegraph, but must, in case of stoppage, go back with signals and protect their trains (this duty being performed by the rear guard when there are two or more guards with the train) as required by the general regulations of the Company, and such guard must in all cases go to the next signal station in the rear, and, with the least possible delay, inform the signalman on duty of the stoppage. If a train or engine is afterwards allowed by the signalman to follow on the same line, the guard of the train which is blocking the line must ride on the engine and point out to the engineman where he left his train. The train or engine thus following must run at reduced speed, and great caution must be observed by all concerned.

These instructions will be in force from and after 1.0 a.m. on the 1st February 1872.

The general block signalling regulations, dated 22nd May 1867, are hereby cancelled.

FRANCIS P. COCKSHOTT,
Superintendent of the Line.

Superintendent's Office,
King's Cross,
January 1872.

APPENDIX C.

GREAT NORTHERN RAILWAY.

INSTRUCTIONS FOR SIGNALLING TRAINS BY ELECTRIC TELEGRAPH.

[Circular 949a.]

From and after 6.0 a.m. on Monday, 7th July 1873, the circular dated November 1872, will be cancelled, and the following system will come into operation at all telegraph stations between King's Cross and York.

Special passenger and horse-box trains (those not in the monthly time table) are to be signalled in the same manner as fast passenger trains.

Each station is to signal ballast trains and light engines to the next telegraph station to which the trains or engines are proceeding.

All other trains are to be signalled in the following manner:—

DOWN TRAINS.

P C TEMPSFORD.—Fast passenger trains to Abbotts Ripton and Holme. Goods and mineral trains to St. Neots.

N X ST. NEOTS.—Fast passenger trains to Huntingdon, Peterboro', Westwood, New England North, Tallington, and Essendine. All trains to Huntingdon and Abbotts Ripton. Goods and mineral trains to Offord.

O D OFFORD.—Goods and mineral trains to Huntingdon.

H G HUNTINGDON.—All trains to Holme. Slow passenger and goods trains to Peterboro', Spital, Westwood, and New England North.

A R ABBOTTS RIPTON.—Mineral trains to Holme. Passenger and goods trains to Crescent junction.

H O HOLME.—Passenger trains to Peterboro'. Goods and mineral trains to Spital, Westwood, and New England North.

Y X YAXLEY.

C I CRESCENT JUNCTION.

P E PETERBORO'.—Passenger trains to Werrington, Tallington, Essendine, Bytham, Corby, and Grantham.

E I ESSENDINE.—Slow passenger and goods trains to Bytham, Corby, and Grantham. Mineral trains to Bytham.

UP TRAINS.

ESSENDINE.—Fast passenger trains to Werrington junction, New England North, Westwood, Spital, Peterboro', Crescent junction, Abbotts Ripton, and Offord. Slow passenger and goods trains to Tallington and Peterboro'. Mineral trains to Tallington.

PETERBORO'.—Fast passenger trains to Holme, Abbotts Ripton, Huntingdon, Offord, St. Neots, Sandy,

Biggleswade, Hitchin, and Box B, King's Cross. Slow passenger trains to Holme, Abbotts Ripton. Huntingdon, and Offord.

CRESCENT JUNCTION.—Goods trains to Yaxley, Holme, and Huntingdon.

YAXLEY.—Goods and mineral trains to Holme and Abbotts Ripton.

HOLME.—Fast passenger trains to Tempsford and Sandy. Goods and mineral trains to Abbotts Ripton and Huntingdon.

ABBOTTS RIPTON.—Goods trains to Offord. Goods and mineral trains to Huntingdon.

HUNTINGDON.—Fast passenger trains to Biggleswade and Arlesey siding. Slow passenger and goods trains to St. Neots. Goods and mineral trains to Offord.

OFFORD.—Goods and mineral trains to St. Neots.

ST. NEOTS.—Fast passenger trains to Arlesey, Hitchin yard box, and Hitchin. Slow passenger trains to Tempsford and Sandy. Other trains to Tempsford and Sandy.

TEMPSFORD.—Slow passenger and goods trains to Biggleswade. Mineral trains to Sandy.

Whenever a train signalling station requires special information respecting the whereabouts of a particular train, the clerk, or signalman in charge of the instrument, must ask for it, and the station called must refer to the book, or to the clerk in charge, for the correct information, and reply with the least possible delay.

The wires between London and York are divided into eleven circuits, as follows:—London to Southgate, Southgate to Welwyn, Welwyn to Hitchin, Hitchin to St. Neots, St. Neots to Peterboro', Peterboro' to Essendine, Essendine to Grantham, Grantham to Newark, Newark to Retford, Retford to Doncaster, Doncaster to York; thus, Kings Cross will communicate with Holloway, Edgware Branch Junction, Hornsey, Wood Green, and Southgate; Southgate with stations as far as Welwyn; Welwyn with stations as far as Hitchin, and so on. It will, therefore, be the duty of terminal stations to transmit the information signalled to them to the stations as ordered above.

In signalling fast trains to stations beyond the terminus of the circuit the through wires should be always used.

Signals must, if possible, be forwarded immediately after the entry of the departure of the train has been made in the time book; and should the instrument be engaged with other services, the station having a train to signal will, after two minutes of such entry, interrupt with the prefix M.T., which takes precedence next after S.P., but where the through wires are used, five minutes must be allowed to elapse before any interruption takes place.

In signalling, it is necessary to give the number of all trains, as shown in the railway company's ordinary time or working excursion bills, together with the time of their departure,—thus: number seven, ten fifty-three. Cattle, goods, and mineral, and also special trains, are to be distinguished by spelling name before signalling the time—thus: No. four goods, eight ten; number eight special, six four, and so on.

In transmitting trains, the following form must be carried out; for example, No. 55 passenger train leaving Tuxford 9.45, having to be transmitted by Retford to Bawtry, Retford will signal it thus—Number fifty-five left T.X. nine forty-five, and so on.

Train signals received must be immediately entered on the slate (where one is kept) and in the train book with the time such signals were received; and when a special train is signalled, the telegraph clerk or signalman must, in addition, immediately enter it on a message form for delivery either to the clerk in charge, inspector, or foreman, and obtain his signature for it in his railway message delivery book.

If from any cause trains have not been signalled in accordance with these rules at stations where clerks are employed, a report of the circumstance must at once be forwarded to the telegraph superintendent at Retford. At stations where the telegraph is worked by signalmen, the report must be sent to the clerk in charge.

At stations where there are telegraph clerks the time of the departure of the trains must be entered in the telegraph train book by the platform policeman or porter, as may be arranged on the duty sheet, and the telegraph clerk must enter the time when the message is transmitted. Where the instruments are in charge of and are worked by signalmen, they must themselves make the entries.

FRANCIS P. COCKSHOTT,
London, King's Cross, Superintendent of the Line.
3rd July 1873.

APPENDIX D.

FORMATION of 5.30. p.m. DOWN EXPRESS.

January 21st, 1876.

Engine 48.
York—Break, G.N.
Newcastle—Third, N.E.; composite, N.E.
„ Composite, N.E.; break, N.E.
Leeds—Composite, Bogie.
„ Third, G.N.
„ Second-class break, G.N.
Bradford—Third, G.N.
„ Composite, G.N., large.
Halifax—Composite, G.N.
Hull—Composite, G.N.
Halifax—Break, G.N.
Total 13.

FORMATION of 8.0 p.m. SCOTCH EXPRESS.

January 21st, 1876.

Engine.
Glasgow—Break, G.N.
Newcastle—Second, N.E.; First, N.E.
Glasgow—Composite, E.C.
Perth—Composite, E.C.
Edinburgh—First, E.C.; First, E.C.; First, E.C.
Edinburgh—Second, E.C.; Break, G.N.
Total 10.

APPENDIX E.

GREAT NORTHERN RAILWAY.

SERIES of Experiments made on February 17th, 1876, with the Break-power attached to Passenger Trains.

The train was composed of eleven carriages, with two six-wheeled and one four-wheeled breaks of the G.N. Company's make, in all fourteen vehicles, arranged in the following order :—

				No.
Six-wheeled	break-van	-	-	1,412
Four do.	third-class	carriage	-	912
Six do.	composite	do.	-	462
Do. do.	do.	do.	-	1,544
Four do.	third-class	do.	-	1,420
Six do.	composite	do.	-	278
Do. do.	do.	do.	-	111
Four do.	third-class	do.	-	1,432
Do. do.	break	do.	-	790
Do. do.	third-class	do.	-	652
Six do.	composite	do.	-	371
Do. do.	do.	do.	-	47
Do. do.	do.	do.	-	50
Do. do.	break-van	-	-	1,047

The engine was of the express passenger class, with 7 feet driving wheels uncoupled, and weighed 32 tons ; the tender had six wheels, and weighed 26 tons.

The total weight of the train, including engine, tender, breaks, and carriages, was 205 tons.

The trials were made between Huntingdon and Holme stations, on the up and down-lines.

1st trial.—On down-line, with ordinary tender-break and guards' breaks in two six-wheeled and one four-wheeled vans ; steam shut off at Abbotts Ripton down distant-signal.

Gradient falling with train -	- 1 in 200.
Speed ($\frac{1}{4}$ mile in 22 seconds) per hour=	40·9 miles.
Train ran after steam was shut off	- 631 yards.
Time occupied in pulling up -	- 44 seconds.

NOTE.—The hind break was not applied.

2nd trial.—On the down-line with Smith's Vacuum break ; steam shut off at Abbotts Ripton down distant-signal.

Gradient falling with train	- 1 in 200.
Speed per hour - -	- 45 miles.
Train ran after steam was shut off	410 yards.
Time occupied in pulling up	- 26 seconds.

3rd trial.—On down-line with Vacuum break ; steam shut off at Holme down distant-signal.

Gradient falling with train	- 1 in 200.
Speed per hour - -	- 45 miles.
Train ran after steam was shut off	451 yards.
Time occupied in pulling up	- 30 seconds.

A second train was now procured at Peterboro' for the purpose of more thoroughly testing the ordinary breaks.

This train was composed of the following vehicles, viz. :—

				No.
Four-wheeled	break-van	-	-	1,004
Do. do.	first class	carriage	-	90
Six do.	composite	do.	-	279
Four do.	do.	do.	-	224
Do. do.	third-class	do.	-	1,649
Do. do.	break	do.	-	884
Six do.	composite	do.	-	215
Four do.	third-class	do.	-	788
Do. do.	composite	do.	-	221
Do. do.	break-van	-	-	1,056
Six do.	composite	carriage	-	371
Do. do.	do.	do.	-	47
Do. do.	do.	do.	-	50
Do. do.	break van	-	-	1,047

The engine of the second train was of the express passenger class, with eight-feet driving wheels, uncoupled, and with a bogie frame on four wheels under the leading end. The engine weighed 39 tons. The tender had six wheels, and weighed 28 tons.

The total weight of the train, including engine, tender, breaks, and carriages, was 209 tons 6 cwt.

4th trial.—On up-line with ordinary tender-break, and guards' break in two four-wheeled vans. Steam shut off at Huntingdon up distant-signal.

Gradient falling with train -	1 in 200.
Speed per hour - - -	45 miles.
Train ran after steam was shut off	795 yards.
Time occupied in pulling up -	55 seconds.

NOTE.—The hind break was not applied.

5th trial.—On down-line with ordinary tender-break, and guards' breaks in two four-wheeled and one six-wheeled vans. Steam shut off at Abbotts Ripton down distant-signal.

Gradient falling with train -	1 in 200.
Speed per hour - - -	40·9 miles.
Train ran after steam was shut off	800 yards.
Time occupied in pulling up -	59 seconds.

6th trial.—On down-line with ordinary tender-break, and guards' break in one four-wheeled van only. Steam shut off at Conington down distant-signal.

Gradient falling with train -	1 in 200.
Speed per hour - - -	45 miles.
Train ran after steam was shut off	1,125 yards.
Time occupied in pulling up - -	70 seconds.

APPENDIX F.

List of Killed.

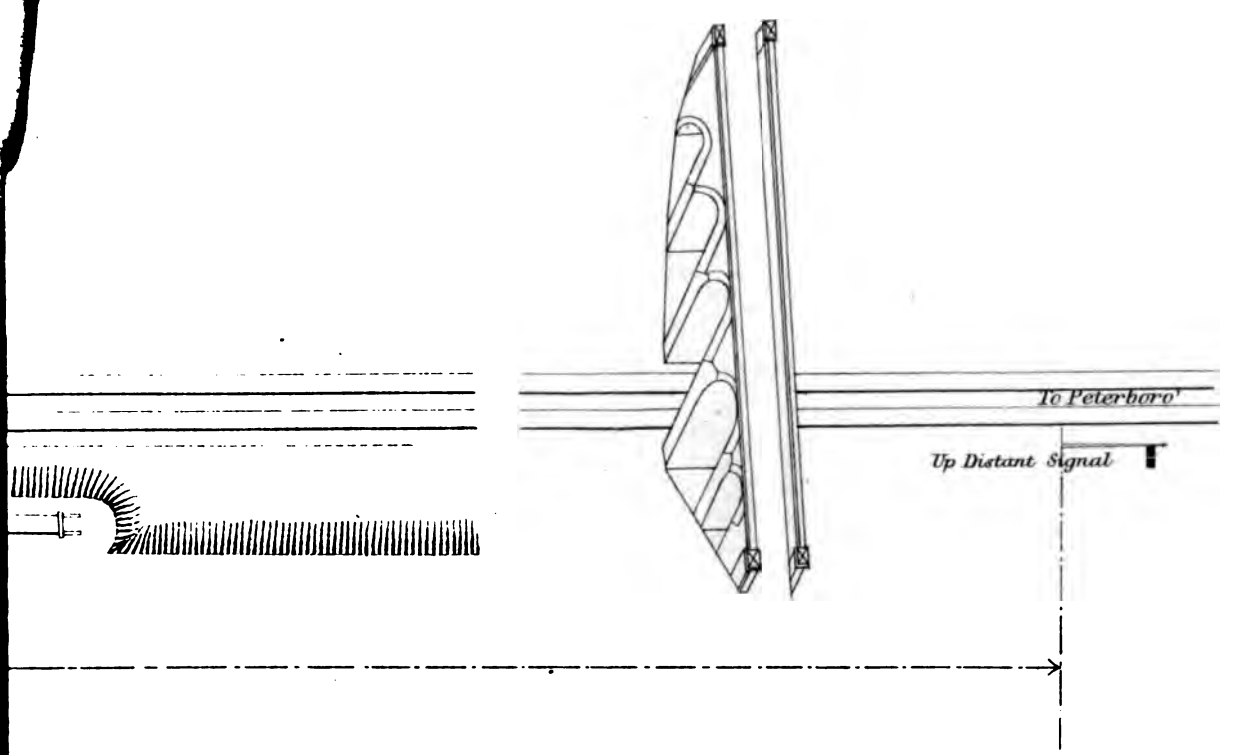
1. Sanderson, Miss Margaret.
2. Sanderson, Miss Elizabeth.
3. Fosberry, Miss S.
4. Fosberry, Miss.
5. Fosberry, Mrs.
6. Jolliffe, Mr. Benjamin.
7. Sanderson, Mr. James.
8. Allgood, Mr. J. C.
9. Allgood, Mrs. J.
10. Allgood, Mr. D. H.
11. Noble, Mr.
12. Boucicault, Mr. W. Dion.
13. Mure, Mr. Thomas.

APPENDIX G.

INDEX to the EVIDENCE.

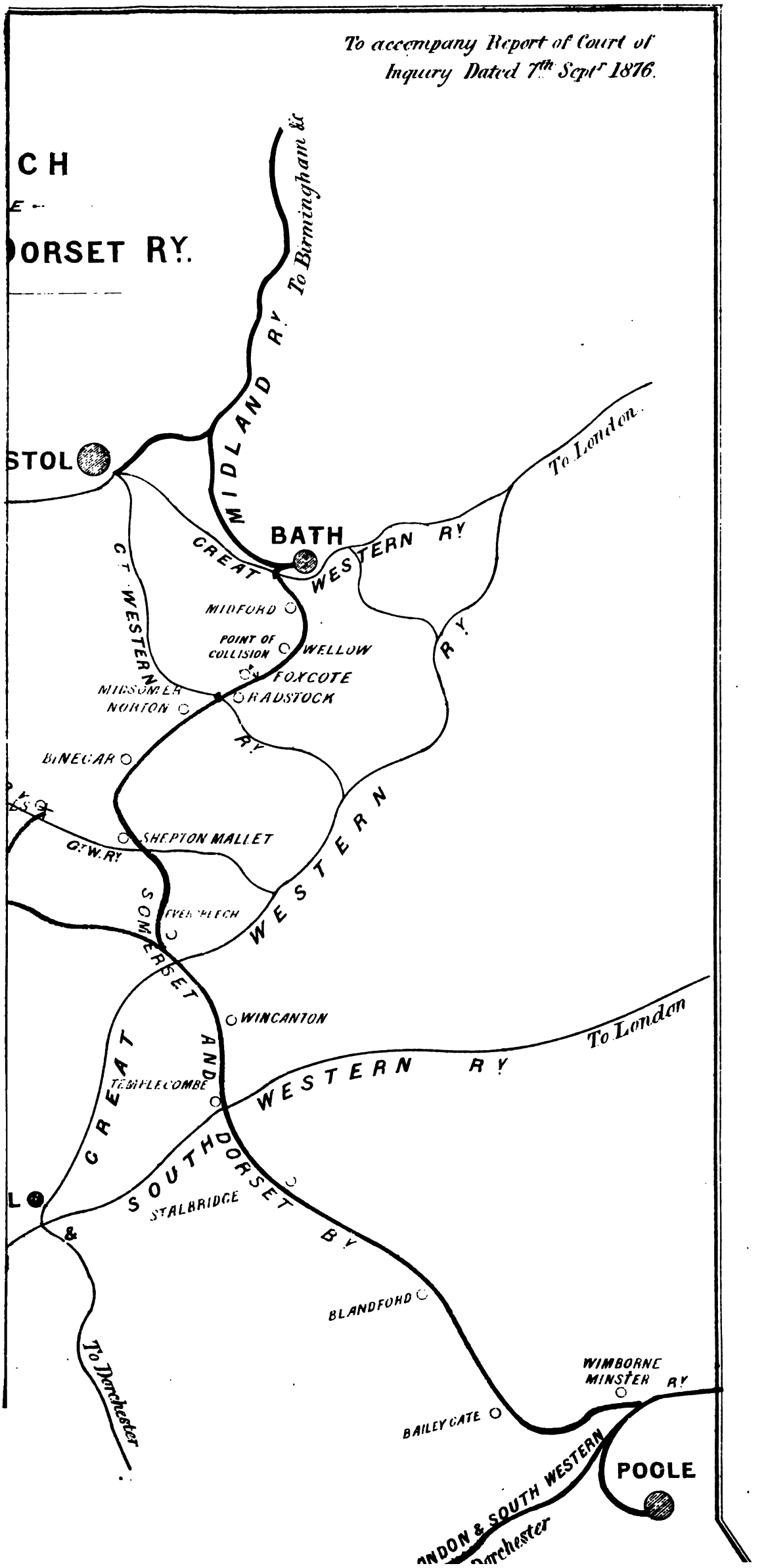
PLATE Nº 1.

To accompany Report of the Court of Inquiry.



FREDERICK DANGERFIELD, LITH. 22, BEDFORD STREET, COVENT GARDEN, LONDON

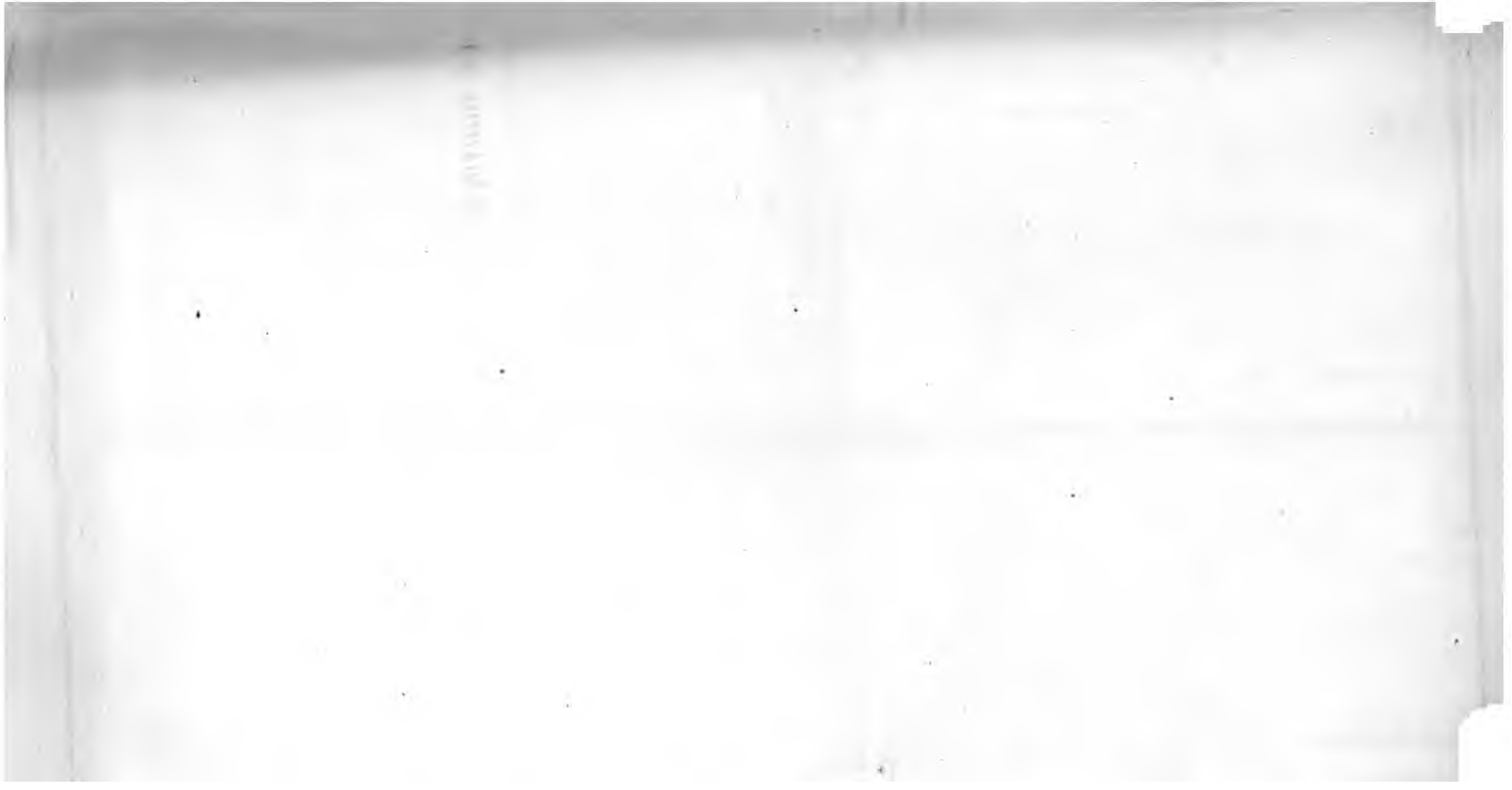
To accompany Report of Court of Inquiry Dated 7th Sept. 1876.

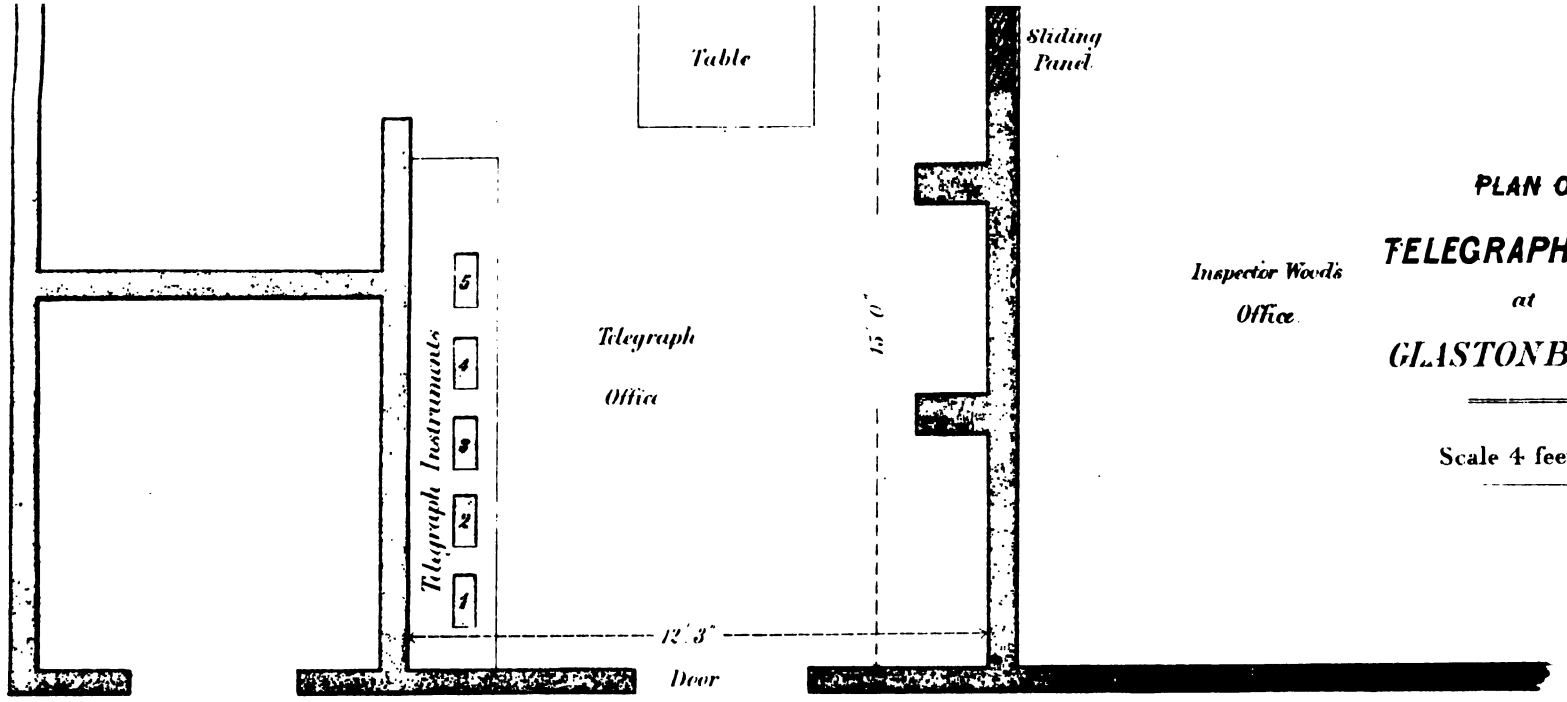


To Burnham

RAILWAY

From Evercreech





PLAN OF

TELEGRAPH OFFICE.

at

GLASTONBURY.

Scale 4 feet = 1 Inch.

ist of Instruments

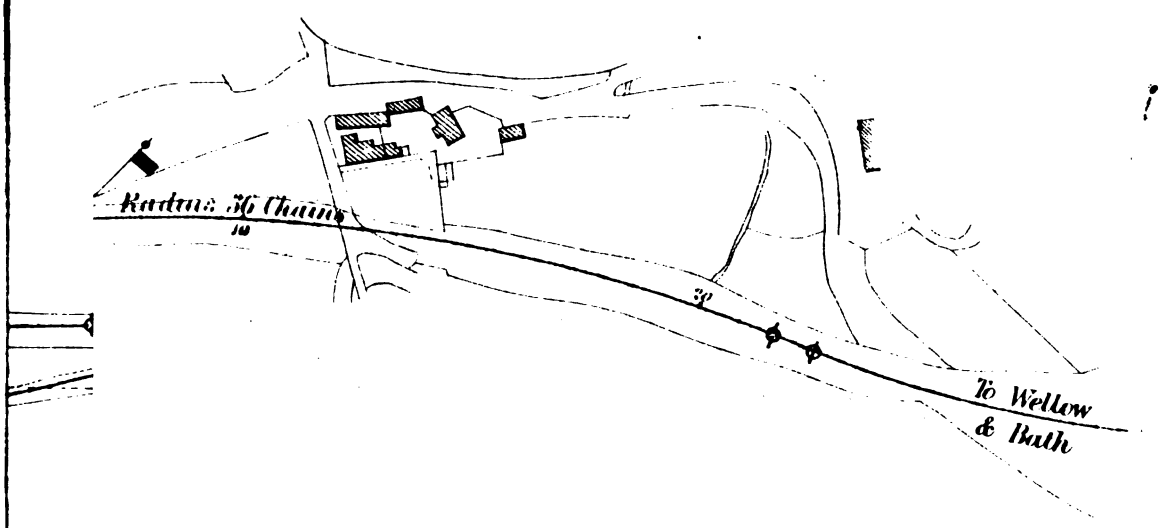
1, Post Office
2, Burnham to Wells
3, Glastonbury to Wimborne
4, Highbridge to Wimborne
5, Glastonbury to Bath

PLATFORM

12 feet wide

From Evercreech **RAILWAY** *To Burnham*

To accompany report of Court of Inquiry dated 7th Sept., 1876.



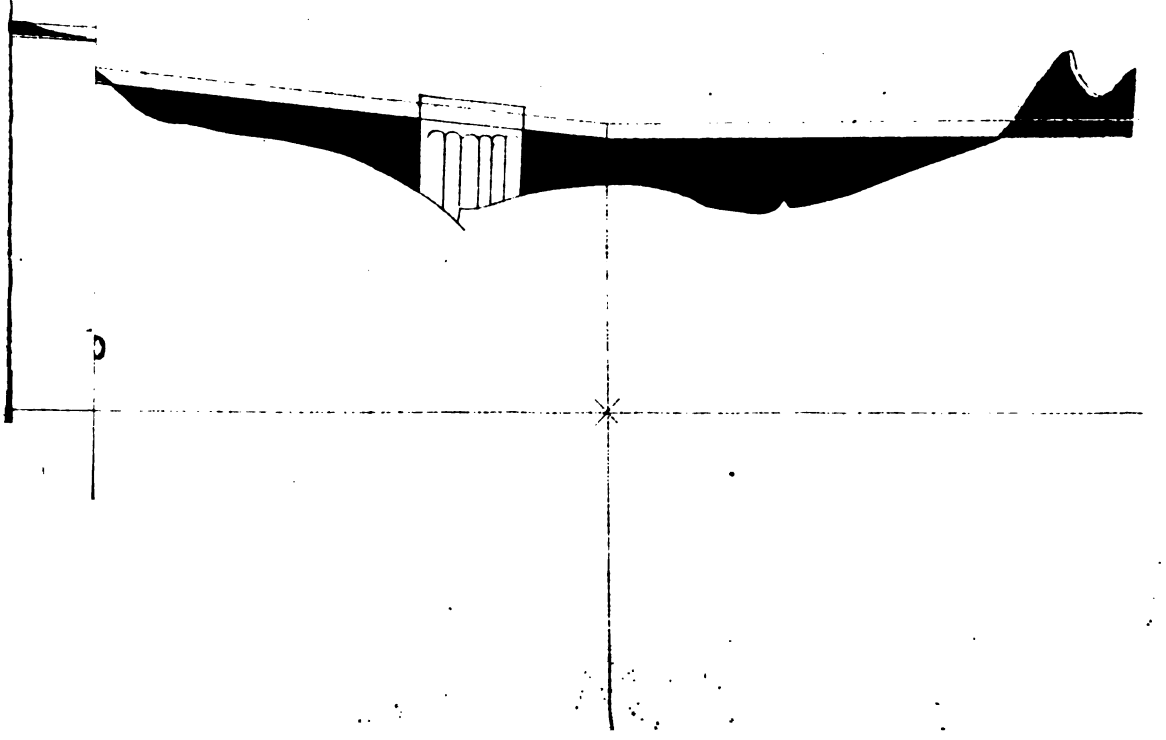
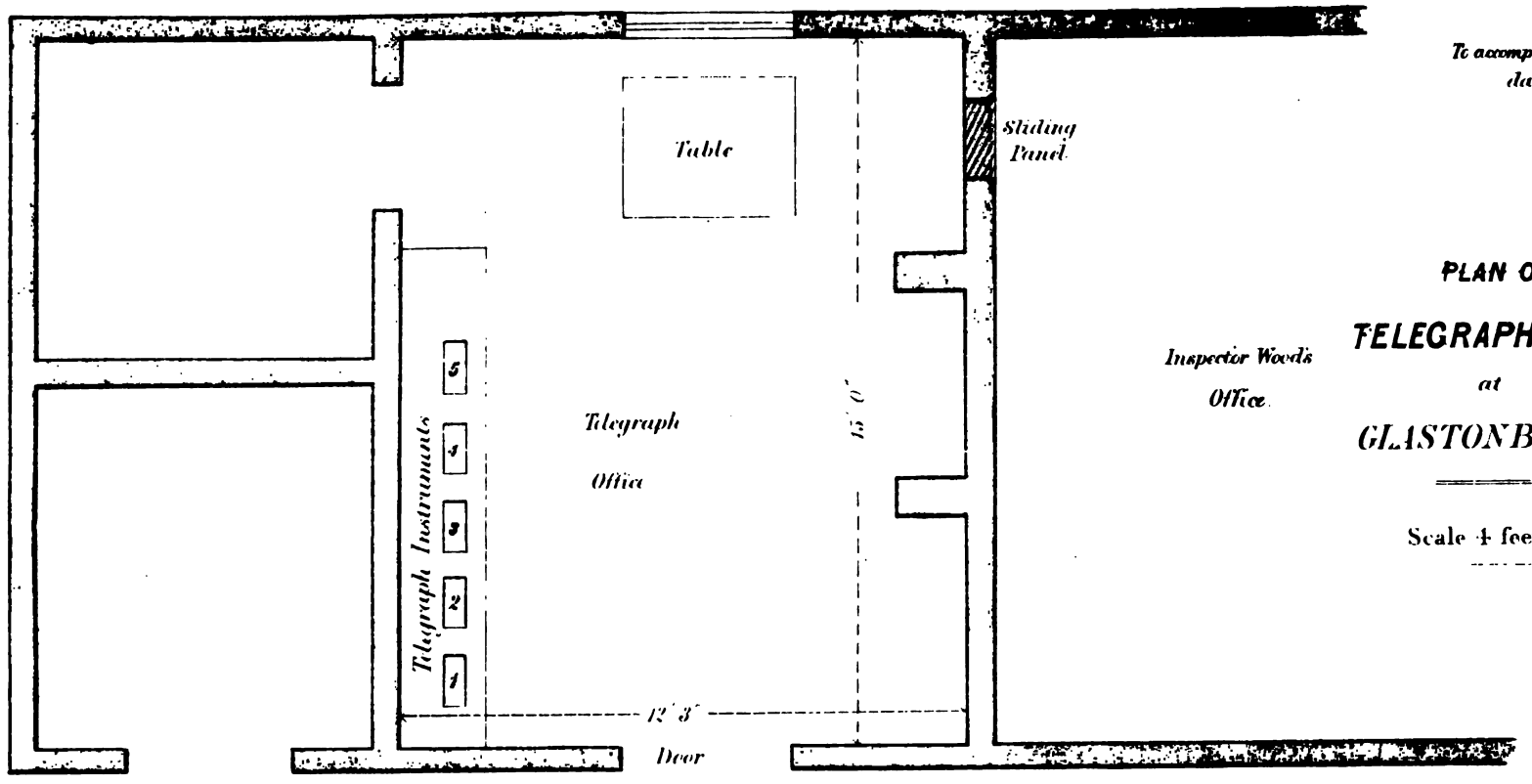


PLATE Nº 2.

To accompany report of Court of Enquiry dated 7th Septr 1876.



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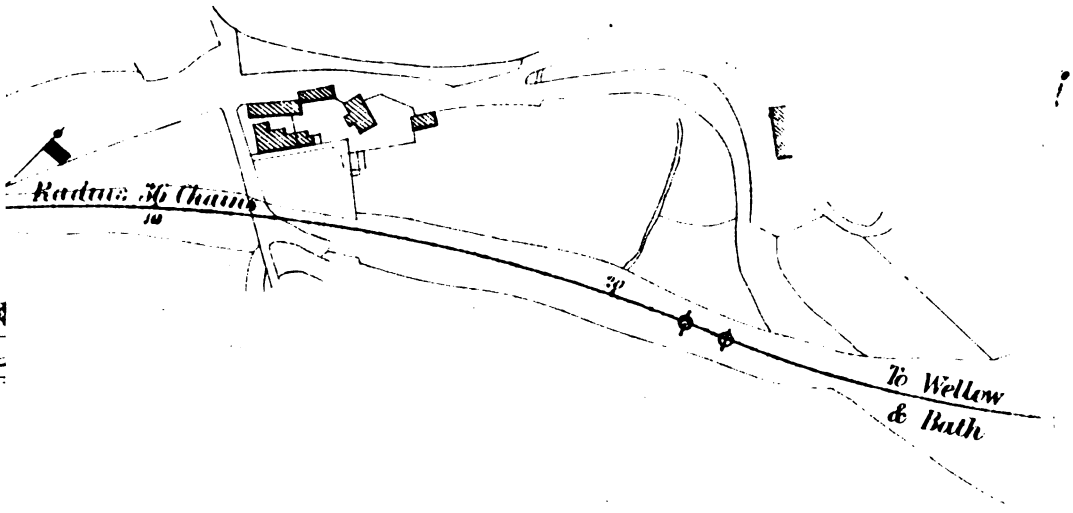
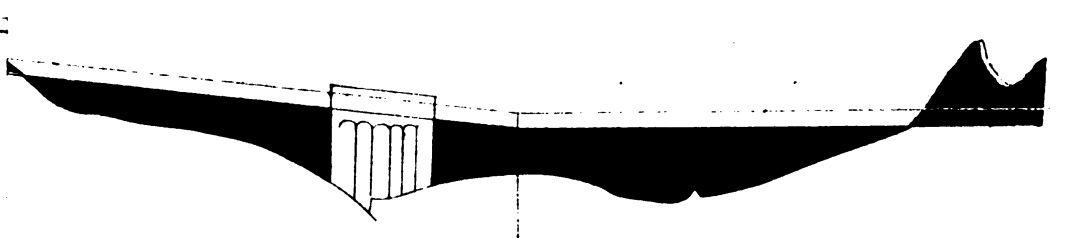




THE REPORT OF THE COURT OF INQUIRY,

HELD IN PURSUANCE OF AN ORDER OF THE BOARD OF TRADE, DATED THE 9TH AUGUST 1876, INTO THE CIRCUMSTANCES ATTENDING THE

Collision on the Somerset and Dorset Railway which occurred near Radstock on the 7th August 1876.

Board of Trade,
(Railway Department,)
Whitehall, 7th September 1876.

SIR,

IN compliance with the instructions contained in the Order of the 9th ultimo, I have now the honour to report, for the information of the Board of Trade, the result of the public inquiry into the circumstances which attended the collision that occurred on the 7th of August, at 247 yards on the north of the Foxcote signal-cabin, about a mile from the Radstock station on the Somerset and Dorset Railway.

This inquiry was held under the Regulation of Railways Act, 1871, with the assistance, as legal assessor, of Mr. W. W. Ravenhill, barrister-at-law, at Bath, in the Guildhall, which the Mayor and Corporation of that city were good enough to place at our disposal. The Court held six sittings, and examined 42 witnesses, who were, with two exceptions, officers or servants of the Company, and their depositions are printed herewith, as well as short portions of evidence given by two of them, Mr. Difford and Mr. Percy, before the Coroner.

I also sat as assessor to the Coroner, having been appointed by the Board of Trade on his application, and made a statement in his Court on the depositions taken by him.

This collision occurred on a single line of railway, between two passenger-trains,—a down-special-train from Bath for Radstock, and an up-relief-train, running special, from Bournemouth for Bath,—whilst travelling between Wellow and Foxcote in opposite directions. Twelve passengers and the head-guard of the down-train were killed, and 28 passengers and six servants of the Company were more or less seriously injured.

The Somerset and Dorset Railway is laid throughout with a single line only. On the 31st of July last a Bill received the Royal Assent under which it became leased by the Somerset-and-Dorset Railway Company to the Midland and London-and-South-Western Railway Companies jointly. It has been worked for some months past under a Joint-Committee of these two last-mentioned Companies, but with the same local management as before.

The collision occurred on the extension line from Evercreech to Bath, which was opened in July 1874, with an undertaking, as to the mode of working, which will be found referred to in the evidence, and is printed as an Appendix (A.) to this Report. In May 1875, a new signal-cabin, called the Foxcote cabin, established by the Somerset-and-Dorset Railway Company, was sanctioned by the Board of Trade, on the section between Radstock and Wellow, to control a colliery-siding. This cabin, about one mile north of the former, and rather less than three miles south of the latter station, is provided with levers for working the usual out-door signals and the points of the colliery-siding, as well as with block-telegraph-instruments, and a telegraph speaking-instrument for communication on the circuit from Glastonbury to Bath.

Evidence.

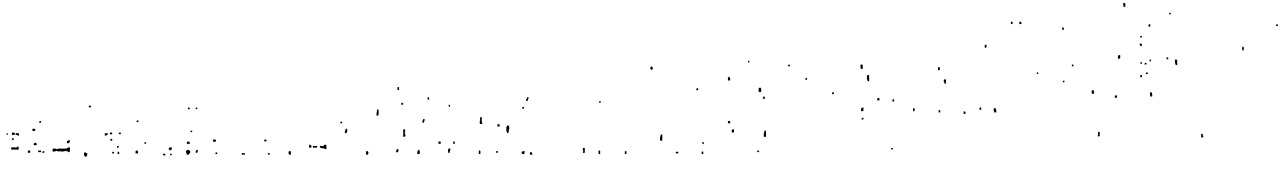
Mr. Harry Chapman, engineer of the Somerset and Dorset Railway (sworn).—I put in a plan of the Somerset and Dorset Railway between Radstock and Wellow, a distance of 3 miles and 70 chains. There is an intermediate signal-cabin, called Foxcote, at the Braysdown colliery-siding, about one mile from Radstock, and rather less than three miles from Wellow. The train from Radstock was proceeding up a gradient of 1 in 198, and the train from Wellow was running down that gradient. The length of that gradient is rather less than 30 chains. There is a curve of 30 chains radius, about 20 chains long. At the Foxcote signal-cabin there is Saxby and Farmer's patent locking-apparatus, and there are telegraph instruments supplied by Maunders & Co. The point of collision was 67 yards on the Bath side of the home-signal on the same side of the cabin, and 611 yards inside the distant-signal. The first sight of the home-signal north of Foxcote is at 1,423 yards for 20 yards; the second sight is at 1,168 yards for 20 yards; the third and uninterrupted sight is at 360 yards. The distant-signal is only visible for 317 yards. The point of collision is 611 yards within the distant-signal, and 928 yards from where the driver could have seen that signal if it had been lighted. The point of collision was 67 yards outside the home-signal, and was between the home and distant signals. The drivers of the trains approaching each other would have seen each other at 200 yards.

Mr. Alfred Colson (sworn).—I am assistant engineer on the Somerset and Dorset Railway, and prepared the diagram put in, being a plan of the site of the Radstock accident. Towards Bath there is a home-signal 180 yards, and a distant-signal 858 yards, from the Foxcote cabin. Towards Radstock there is a home-signal 221 yards, and a distant-signal 888 yards, from the cabin. The curve on which the collision occurred has a radius of about 30 chains. I put in a plan of the telegraph office at Glastonbury, which is 15 ft. by 12 ft. 3 in. The only room having communication with the office is a small lumber-room on the south of it. The plat-

form between the telegraph office and the rails is 12 ft. wide. The telegraph office is at the south of the station building, with the exception of a small cloak room. On the north of it there are the inspector's office, the booking office, and the waiting-rooms. There is a sliding panel at the north-west corner, between inspector Wood's office and the telegraph office; it is about 18 inches square. The front door has no sliding panel. The plan is to scale, excepting in regard to the width of the platform.

Mr. Abraham Difford (sworn).—I am superintendent of the Somerset and Dorset Railway, and have had the management of the train service for about 14 years. The change in the ownership, by its passing into the hands of the Midland and South-Western Railway Companies,—on the 13th of July of this year, the date of the Royal assent to the Bill,—has not affected my position. I have had no fresh instructions from anybody. The part of the railway where the accident occurred was opened in July 1874. Since then the Foxcote signal-cabin has been erected, and it was opened for traffic on the 24th May 1875, when the colliery siding was also ready for opening, and was opened at the same time. I put in the general regulations for working the Somerset and Dorset single line. The instructions in the little paper produced, containing instructions for working the single line by block-telegraph, are the same as those exhibited in the signal-cabins on a larger scale. They were issued in this form in July 1874, having been in operation since 1864, and having been in use ever since. A larger board put in contains only instructions regarding the working of the telegraph instruments, with the exception of one paragraph, No. 30, which relates to single-line working, and also paragraph 9, which describes the prefixes to be attached to different messages. Paragraph 30 applies to the whole line, and is devised to keep the crossing agent at Glastonbury informed by station agents of the running of the trains, so that he might know how to deal with the crossing places. I saw both of the instruction boards referred to hanging in the Foxcote signal-cabin on the day following the accident in question. Rules 1 to 14, and the remainder of the instructions (read) apply to Radstock and Wellow, and in a degree to Foxcote, but that not being a crossing-place, some of the other rules cannot apply. The Foxcote signal-cabin has been inserted since the rules were drawn up; but before then stations, not crossing-places, Spetisbury, Masbury, and other stations, including three junctions, existed. Windsor Hill, and Foxcote are the only places on the Bath and Evercreech line neither crossing-places nor stations; and they have been erected since the opening of the line, and since the rules were drawn up. The Foxcote signal-cabin was established to control the Braysdown colliery siding. The signalman's duty there would be to give "line-clear" to one of the stations, provided his siding was clear, and his points and signals were right, and he had not given "line clear" to a train in the opposite direction. He has the usual instruments of a station, two block-telegraph instruments, one to Radstock and one to Wellow, and a speaking instrument, but I am not certain with what places it is in comumnication. There are home and distant signals in each direction at Foxcote. They ought to have been lighted on the night of the accident, but I do not know that they were. The instructions about communicating with the crossing agent would not apply to Foxcote as it is not a crossing-place. The Foxcote signalman acts on his own motion without such instructions from the crossing agent. All he has to do is to receive "line clear" for trains, and then pass them on. If trains are out of course or not in the working time table, a station-master can send them forward without an order from the crossing agent, if he had "line clear" from the station beyond, and there was no train due in the opposite direction. The security would rest in the block telegraph from Foxcote that there was no train coming from that direction. When the station-master at Radstock sends a train forward towards Wellow, he communicates, not necessarily with Wellow, but with Foxcote, and obtains "line clear" from there only. Wellow could only send a train forward after communication with the Foxcote signalman, and that man's duty would be not to do so if he had already a train coming from Radstock. I rely upon the signalman at Foxcote that trains shall not be sent from Radstock and Wellow in opposite directions at the same time, and that without communication with the crossing agent at Glastonbury. That may be done in the case of all trains. The cabin at Foxcote is used so as to allow a second train to follow from Radstock to Foxcote when a preceding train has gone on from Foxcote to Wellow, so that although Foxcote is not a crossing-place, two trains may be following between Radstock and Wellow at the same time, protected by the block station at Foxcote. (Certificate sent to Board of Trade provides that only one engine in steam, or two or more engines coupled together, shall be on the portion of line between Radstock and Wellow at one and the same time. *See* Appendix A.) The instructions, I consider, cover the working of these intermediate cabins, as I consider such posts to be "stations." The signalman receives instructions to allow an irregular train to proceed by rule 13, with a red flag by day and a red light by night. When, according to that rule, he sees an engine with the red flag, he knows it is his duty to let the train proceed out of its ordinary course. There are two pointsmen stationed at Foxcote, taking duty alternately, the hours being fixed by the inspector (Wood). The last paragraph on page 27 is faithfully carried out. (Foxcote line clear cabin book put in.) The Foxcote line clear book is not inspected according to that rule, as it is not a station signal-cabin. The trains that came into collision were the 9.15 p.m. special train from Bath to Radstock, due to reach Radstock at 9.45, and a divided portion of an ordinary train from Bournemouth at 6.10, to Radstock 9.25, and due to leave again at 9.27. The first portion of that train was in the working time-table. Either at Wimborne or Bournemouth the train was divided, and the portion that came into collision was in no time-table, but had been advised by telegraph. The first train was timed to leave Bath at 9.15, but was very late. The other train had no time, and the preceding train should carry the train-signal, if my instructions were carried out. The crossing agent at Glastonbury would have been informed that the Bath train was running late, in order to deal with its crossing-places. It would be his duty to advise only the agents at crossing-places of its running late. Other stations need not have been informed by him. As regards the relief train in the opposite direction, it was the Glastonbury crossing agent's duty to advise all stations of the running of that train, but not the Foxcote cabin, which has not been considered a "station" in that respect. The station agents at crossing-places have the whole responsibility under the crossing agent for crossing trains. Had trains been despatched simultaneously from Radstock and Wellow in opposite directions they would be pulled up by the interlocking of the signals at Foxcote. Foxcote introduced a new block-section, and the signalman there is under the instructions, except, of course, as to crossing, which he does not perform. The Foxcote signalman may be considered as a station agent. Windsor Hill, a similar post, was opened some time this year. Trains would pass through Foxcote without stopping, provided the signals were down. In the case of a train passing Foxcote without stopping, the signalman there would, immediately on receiving notice of the train leaving Radstock, ask permission for it to proceed to Wellow. If he did not get "line clear" from Wellow the signals would be against the Radstock train. It would be nothing unusual for a train to approach Foxcote at 11.10 p.m., the time of the collision. The ordinary trains passing Foxcote run up to 12.25. The agent at Radstock would have had information by telegraph of the running of the relief train and its time of leaving Wimborne, and could calculate its time for Radstock. The Weymouth special train was also due about the same time. When I mention the crossing agent I include his assistant, who relieves

him. The Foxcote cabin was inspected by Colonel Rich some time in May 1875, and since then there have been no alterations at Foxcote. I put in all the letters I have received from Mr. Percy since the 1st January 1876 respecting difficulties he has experienced in performing his duties. There are 14 or 15. The first was a complaint of Pylle, in regard to which Mr. Percy and the stationmaster did not agree, and the result was that the crossing was not changed, and some delay occurred. Second.—Complaint of Bath. The fault was there admitted. Third.—Wellow, February. Complains of several bad cases at that station. The stationmaster puts the blame on his own clerk, who neglected to attend to the instrument. The clerk said it was Glastonbury's fault in not calling properly, and he added that the instrument was weak, a statement denied by the telegraph department. Fourth complaint.—Binegar, Shepton Mallet seems to have been in fault. The station-master acknowledges that there was remissness on the part of signalman Rodd. The guard of a train should have informed the telegraph clerk at Shepton that a bank-engine had come with his train. Fifth, 23d March 1876.—Inattention at Wellow, the papers are lost. Sixth, 27th March 1876.—Complaint of Shepton's inattention. The station-master says he had "taken up" with the telegraph clerk for his neglect. This clerk stated that he had overslept himself, but pleaded that a train had been overladen at Evercreech. Seventh.—Radstock. Complaint of inattention. The station-master replies that the telegraph might have been neglected but no train was delayed. Eighth.—Complaint of Chilcompton. There was no train in question in this case. Ninth.—Complaint of Midsomer Norton. Papers lost. Tenth.—Complaint of Wimborne respecting train advices. The station-master expresses regret and trusts there will be improvement. Eleventh.—Complaint of Shepton. Twelfth.—Complaint of Midsomer Norton. It was stated that there was no delay of trains and regret was expressed. The clerk was attending to other duties. Thirteenth.—Complaint of Shepton. Fault admitted. Fourteenth.—Complaint of Radstock. Resulted in serious irregularities. The station-master says Mr. Percy exaggerated. Mr. Percy could not retract, and added another complaint. An inspector sent to inquire, reported that Radstock was in fault in the case. Fifteenth.—Complaint of Bath's inattention. It was replied that the clerk could not get into the office. These were all the complaints within the given time. There is no crossing-order required when trains are in order, but one is always used when they are otherwise. Of the trains that came into collision, the down train should not have been allowed to leave Wellow without a crossing-order, because the station-master had received telegraphic advices of the running of the train which came into collision with the train from Bath, and also because the train from Weymouth, of which he had a special printed time-table, was due at Wellow before the special from Bath had left that station. As regards the up-train that came into collision, there is no absolute rule for Wellow to need a crossing-order before sending on the train to Radstock that met the up relief train, but there is an absolute rule that the down Bath train should not have left Wellow without a crossing-order until the arrival there of the up Weymouth train, because that train was over-due at his station before the down Bath special was started from his station. Rule 30 of the Electric Telegraph Department applies to this. The up-special would have required a crossing-order before leaving Radstock for Wellow. It was the station-master's duty not to allow the engine-driver to leave Radstock without a crossing-order; and it was the duty of the engine-driver, before leaving Radstock to have asked for a crossing-order or for instructions as to where he should cross the down-special. He was not justified in leaving Radstock without either a crossing-order or obtaining information as to the position of the down-special. It was the duty of the station-master at Radstock not to have sent forward the up-special on the night of the accident without communication with Glastonbury. It would be his duty, under his rules, that he should ask where the up-special should cross the down-train, which was over due. Mr. Percy's complaints referred principally to the want of train advices. As soon as the up-train of the collision had asked line-clear from Midsomer Norton to Radstock, the latter should have communicated with Glastonbury that he had got the notice of that train, and that he had received no notice from Wellow of the train from Bath. It is undoubtedly necessary that the crossings of trains, of which there are no printed time-tables, should be carefully provided for, and, if anything, more so than the crossings of trains which are in the time-table; and rule 30 applies to Radstock in this particular instance and to Wellow as regards the Weymouth train. Rule 14 rendered it incumbent on the engine-driver of the up-train to inquire for a crossing-order at Radstock. I travelled by the 8.11 a.m. from Glastonbury to Poole on the 7th August, and found the train very heavy, so I determined to run it back in two portions. First I had to ascertain where I could get an engine and carriages, and when I had done that I sent the message, which Mr. Percy has already produced, to him at Glastonbury. On my return to Glastonbury, about 5.20 p.m., I went to Mr. Percy's office and saw him, and found that he had received and understood my message. I had nothing more to do with the train, and left the matter in his hands in the usual way. When a train is run in that extraordinary way, I leave, as always, the crossings to Mr. Percy. I have nothing to do with crossing arrangements. I am as much shocked as anybody to find what duties the boy Hillard has been allowed by the station-master to perform. I consider that the station-master Sleep had no authority to leave his station when he did, at 6.30 p.m. on the 7th August. I think Mr. Wood's arrangement was safe for the ordinary working of the line, which permitted Sleep to leave duty at 6.30 p.m., but it was not expected that he would absent himself when there were special trains. Had no accident occurred, I should certainly have censured Sleep for doing so, if it had come to my knowledge. If an inspector observed such conduct he would report it. I do not consider it necessary to instruct a station-master, as in the case of Sleep, to remain on duty; his sense of duty to the Company ought to govern him. If Sleep went from Wellow to Midford without my leave, he was doing what he had no right to do. A station-master is never off duty, and he may not leave his town or village without my permission. According to Mr. Wood's arrangement, Hillard and Gillard were in joint charge at Wellow, and I think that would be safe. I was not aware till this inquiry of the way in which the work was done. The station-masters on our railway have immediate supervision of the working of the signals. Hillard and Gillard would have to agree when in joint charge as to the working of the signals, but perhaps not so far as to the telegraph work. An extra wire on the Bath circuit would undoubtedly be advantageous, and before this accident occurred an extra wire had been ordered. I do not think train-advices or crossing-orders have been delayed in consequence of the pressure on the present wire. I never heard before this inquiry of the O.A. signal, and I have now been informed that it is used as a terminal for messages, to show that they are completed. I consider that its use to check such a message as was sent from Radstock was improper. I consider that Mr. Percy can only arrange crossing-places on information from the station-masters, but if I had been in his position on the 7th August my anxiety for the up relief-train would have led me, if I was not otherwise engaged in more important matters, to make inquiry of it to Radstock. I take the words, "I will arrange the crossings," in Mr. Percy's message to be superfluous; only he could arrange its crossings, and I have not a shadow of doubt that after receiving that order it should still be the duty of Radstock to inform Glastonbury of the train in question. It was the duty of the Radstock station-master to have a crossing-order before sending on the Wimborne train.



should have left duty at 11.30 p.m. on Monday had it not been for the accident. I acted according to rule 30 of the Electric Telegraph Department as to train advices. I do not record the changes of crossing-places in a book, but have my crossing-orders to show. The first notice I received regarding the relief-train was a message received at 4.19 p.m. from "Superintendent of line, Templecombe, to Mr. Percy, "Glastonbury. I have sent one of the engines "of 12.50 up-goods back to Wimborne, running to "times of 1.50 down. It will work from Wimborne "to Bath as 6.10 up ordinary, which train will follow "special with excursion passengers." I took it to mean that the special engine sent from Templecombe would bring the 6.10 train, and that the 6.10 would follow a special train from Wimborne. I first of all advised all stations from Templecombe to Wimborne, (sending to first place at 4.23,) that a special engine had left Templecombe for Wimborne at 4.10 p.m., crossing No. 14 up-train at Blandford. I then telegraphed to the station-master at Wimborne at 5.48 p.m., to advise me as early as possible what time the special which would follow No. 18 up-train would be ready to leave Wimborne, and received a reply by telegraph,—not a coded message, and of which a copy was not taken,—that she would be ready to leave at 7.10. I then sent a message at 7.18 p.m., "From "Percy, Glastonbury, to all stations. A special "train will leave Wimborne at 7.10 for Bath. I "will arrange its crossings." Foxcote was not included in those messages sent to all stations; it is not generally included. There was another message at 7.13 from me to Wimborne, Bailey Gate, and Blandford to say, "A special train would leave "Wimborne at 7.10, crossing No. 12 down ordinary "train at Bailey Gate." Also a message sent to station-master, Templecombe, at 9.7, "Keep up special "train at Templecombe to cross No. 17 down "ordinary train. Repeat." This message was repeated. I then sent a message to Wincanton at 9.13 p.m., "No. 14 down ordinary train will cross "up special at Templecombe. Repeat." It was repeated. Those were all the messages relative to that train. I produce my book of advices as to running of trains, showing that I received a message from Wimborne that the special had left there at 7.24. No arrangement was made for the crossing of the special train from Wimborne with the down special train from Bath, with which it came into collision. The reason was that the train from Bath was due to reach Radstock, and would leave Radstock on its return to Bath, before the up-special train might reach Evercreech junction. I got no advice of the late running of the train from Bath until I asked for it in the first place at about 9.50. I asked whether it had left or what time it would leave, and received a reply that the train was not ready. Neither the question nor answer was recorded. I was then engaged with other crossing-orders till 10.39 p.m. I then called Bath, and asked him for the advice of the special train, asking if the special had left. They gave in reply the signal wait a minute, by means of the letters M I N. After a minute or so, being anxious about the train, I called Bath again, and the departure of the train was then telegraphed from Bath, and my clerk called out 10.23. I instructed him to call on the speaking instrument to Bath ticket platform to ask about the train, and found that she passed there at 10.48. I was then engaged with my crossing-orders for other stations on the line up till 10.59, when we commenced to call Wellow. We could not get Wellow's attention until 11.12 or 11.13. Being anxious, I asked, "Where is down special?" They replied "Over T," from which I understood that she had been taken on the block at Foxcote and passed there safely. They added, to "Over T" that "Up was on from T" about 11.12 or 11.13. I understood from that that the down-train would have gone safely into Radstock, and that the up-train would have left Foxcote for Bath. I next called Radstock, and asked for the down-special. It was replied, "I don't know," and to the best of my recollection they added that the up-special had left Radstock. This would be about 11.15. The messages referred to were sent either by myself or my clerk, by the speaking instrument in my office. We proceeded to call Wellow, but could not get its attention. I found a defect in the telegraph (no doubt caused by the collision), which prevented my working beyond Radstock and Foxcote. I kept trying to ascertain particulars of the down-special from Radstock. I was told from Radstock that the down-special from Bath had not reached that station, and at 11.37 I learnt from Radstock that there had been an accident. In a few minutes I sent for the superintendent's chief clerk; he came to my office, and I informed him of the accident. We went together to Mr. Wood. I was in my office with my telegraph-clerk from about 7 p.m. till the time of the accident; my assistant, Seymour, had left me about 6.30 p.m. Any train working out of the ordinary course and not in the time-books I should advise its time of starting, &c., as in the case of the engine and special-train already referred to. No crossing-place ought to be appointed or employed for trains not working as prescribed in the time-tables, except under arrangements by myself or my assistant. I should say that trains do not often cross out of their ordinary course without my direction. It does not happen every day. As a rule I receive advices of trains in order to manage the crossing-places, but occasionally the station-masters neglect that duty, and I am unable to make proper arrangements for crossings. I then make inquiries, as I did about the Bath train. It might be daily that I have to ask as to the course of trains when the station-masters do not send information as they ought to do. I have difficulty frequently to obtain the attention of a station-master when making such inquiries. Otherwise there is no difficulty in getting information. I find a difficulty sometimes in obtaining attention early enough to arrange the trains, and it is chiefly through having to secure attention. There would be no difficulty if station-masters obeyed their instructions, and sent me the advices properly. The result of the want of information would be delay to trains. I can hardly say that trains never change out of course without my arrangement; it is a very rare thing, but it has happened. John Locke was the telegraph-clerk who was with me in the office. I should never inform the Foxcote man of crossing arrangements, but I should advise Radstock and Wellow of any change affecting their stations. Foxcote would not telegraph to me, nor would Radstock and Wellow signal trains to me. I should have no advice between Bath and Shepton Mallet. Taking a train leaving Bath: I should be informed of its departure, and if an up-train were late, I should be informed by Wellow of the running of the trains, or I should ask Wellow, but I should not know directly from the station-masters. I have made written complaints about my inability to get proper information about trains from station-masters, as above stated. They have been numerous. I have no other duties than that of crossing agent. The system of changing a crossing-place is as follows: a train coming from Bath, timed to cross an up-train at Wellow, and the up-train being late, it would be my duty to send an order "Keep No. — up-train at Radstock to cross No. — down-train at Radstock." That keep-train order would be repeated to me from Radstock, to show that it was correctly understood, and I should then telegraph to Wellow "Send on No. — down-train to cross No. — up-train at Radstock." This message is repeated to me. I always get the keep-train message acknowledged before sending the send-on order. The complaints referred to have not increased of late. I might get as many as three on one day, and not any more for a fortnight. I frequently see the answers addressed to the superintendent by the station-masters to my complaints, but I make no written note of them. They are returned to the superintendent. I noted the time, 11.37 by the clock, when I had information from Radstock of an accident having occurred. The books kept in my office are a train advice book and a note book. The latter book is used to record

delays to trains. I have a letter copying book in which I preserve some letters. I wrote all the messages which my clerk transmitted. When blanks are left in the train advice book of the times of very late trains arriving, when there is no one in my office, they are filled up from subsequent information. If we do not get the advice of a train at the proper time, we ask for it, and then put it in the book, so there are no blanks. The train leaving Wimborne was regularly reported, and the Bath train was reported from Bath. Knowing that one train left Evercreech at 10 o'clock, and the other left Bath at 10.43, it occurred to me that the down train would get to Radstock and return to Bath in front of the up-special. I should calculate that the train leaving Evercreech at 10 would reach Radstock about 11.15. I learnt yesterday that it reached Radstock at 11.2 that night. The Bath train, I should calculate, would get to Radstock at 11.15. I was waiting for the up-special to reach Radstock, and to get advice of it, to arrange the crossing. Generally I only get advices from Radstock after asking, but sometimes they send them spontaneously, and I do not record those advices. I was occupied with crossing-orders or I might have asked Radstock for the advice of the train. It took me 14 minutes to get the attention of Wellow about the down-train, and that was why I did not ask about the up-special to Radstock. It was from 10.59 to 11.12 or 11.13, except for one minute, that I was engaged calling Wellow. During that minute my clerk was taking a train advice from Templecombe. This book assists me in arranging crossing-places. All trains are reported, but I have no duty to perform except as regards the trains which are out of course, and the crossing-places have to be changed. The train advice book is the one upon which I rely for changing the crossing-places of trains. It would assist me further to have a book with more stations in it. It was what I wanted on the night of the accident. The first train was due to leave Bournemouth at 6.10, and ought to have crossed the Bath train at Wellow, which I arranged; next came the train from Bournemouth that met with the accident, and, thirdly, a train leaving Wimborne at 8.11. I produce the crossing orders sent on the day of the accident from 9 o'clock p.m. (1) Binegar, sent 9.7, repeated 9.8. (2) Chilcompton, sent 9.9, repeated 9.10. (3) Pylle, sent 9.15, repeated 9.16. (4) Pennard, sent 9.19, repeated 9.20. (5) Shepton Mallet, sent 9.24, repeated 9.25. (6) Binegar, sent 9.26, repeated 9.27. (7) Evercreech junction, sent 9.27, repeated 9.28. (8) Pylle, sent 9.30, repeated 9.31. (9) Bath, sent 9.55, repeated 9.58. (10) Wellow, sent 9.59, repeated 10.0. (11) Wellow, sent 10.19, repeated 10.20. (12) Radstock, sent 10.22, repeated 10.23. (13) Wellow. Told Wellow at 10.35 to keep the Bath special at Wellow to cross an up ordinary and up special from Burnham. Repeated 10.36. (14) Radstock, sent 10.35, repeated 10.36. To send the Burnham train to cross down Bath train at Wellow. (15) Wincanton, sent 10.57, repeated 10.58. (16) Templecombe, sent 10.59, repeated 11.0. (17) Cole, sent 11.15, repeated 11.16. (18) Wincanton, sent 11.17, repeated 11.18. There were these 18 crossing orders between 9 and 11 p.m. on the night of the accident. The case where the accident occurred was the first attempt on that day to cross trains without my order. Each crossing requires two forms—a keep order is sent first and repeated before the send-on order is given. The two crossings for No. 16 train were accomplished. I produce the note book referred to in my former evidence. It is kept as my record of any delays which I may have to account for. I had none such for the day in question. The complaints produced by Mr. Difford are all to my knowledge that I made within the time. In regard to the evidence of John the telegraph clerk at Radstock as to the crossing of No. 18 down goods train by the 7.10 from Wimborne, I explain that No. 18 down goods train was timed by the printed tables to cross the Weymouth train running 32 minutes behind the 7.10 Wimborne train at Shepton Mallet, and as the 7.10 Wimborne train was running ahead of the Weymouth train, which was timed to cross No. 18 at Shepton Mallet, therefore the Shepton Mallet station-master could not start No. 18 down goods train until after the up Weymouth train had reached Shepton Mallet. Trusting to that I deliberately did not make a crossing place for those trains. It is very rarely that we have such circumstances, but I have under similar circumstances done the same thing before. I sent telegram produced at 7.40 on the day of the accident, saying I would provide for the crossing of the 7.10 Wimborne train, and consider that I did so. I advised Shepton Mallet in the message quoted above how the 7.10 Wimborne train was running. I have no record of the places which telegraphed the Wimborne train to me, but I remember three, viz., Wimborne, Templecombe, and Evercreech. The Wimborne train left Evercreech junction at 10 p.m., whereas No. 18 down goods train was due to arrive there at 9.46. In regard to John's statement, that he attempted to telegraph in regard to the Wimborne train, I give it a contradiction. John did afterwards give me O.A. when I tried to ask him something. There was no attempt from any station after Evercreech junction to send any message as to the Wimborne train till the collision occurred, and I did not ask any station about it. It is not possible that the clerk Locke in my office could have received any question or given the O.A. without my knowing it. After completing the crossing orders for Templecombe and Wincanton, we immediately called Wellow, commencing at 10.59, and kept on till 11.4 or 11.5, when my clerk took the departure of a train from Templecombe. It was at that moment, about 11.5, that he made inquiry of Radstock about the up relief train and received O.A. I did not know this when I gave my evidence here the other day, and all I know now is from what my clerk told me. My clerk told me that he took the train from Templecombe, asked Radstock about the up relief train, received O.A., and immediately resumed calling Wellow. We continued calling Wellow till 11.12 or 11.13 about the Bath special. The first information I received from Radstock was about 15 minutes after the up relief train had left Radstock. It was after I received the message "Down over T. and up on from T." from Wellow that I received that information from Radstock. It was about 11.12 or 11.13 when I received the messages from Wellow "Down over T. and up on from T." They came together as one message, there being no perceptible interval between them. There was nothing before or after from Wellow. The message did not excite any apprehension in my mind at that time. After this, about 11.15, I called Radstock, and got the reply that the down-train was not in and the up-train had left. I am not clear as to whether it was then Radstock gave O.A. in reply to my questions, or whether Radstock did so at all, but I have no doubt it was done. I can remember no other case except the one referred to in which I did not arrange the crossing places of trains on the day of the accident. I consider it was the duty of Radstock under the regulations to have informed me when they received notice of the up relief train from Midsomer Norton; and it was also the duty of Wellow to advise me of the Bath special when it left Midford. I did not ask Radstock about the up relief train, because I did not expect it to be there. I deny that the message from Radstock was rejected, because my clerk was engaged at another instrument between 10.51 and 10.59. At 10.59 I looked at the clock. I left the office for two or three minutes, but I think my clerk would have told me of any message he had received. I did not remember until I heard John's evidence that at 10.30 he asked how the excursion trains were coming, but I know he did so. Before 10.51 I was in the office about three yards from the instruments. I looked at the clock when I left the office, and it was 11 p.m. precisely. It would not have been more than five minutes that I was out, but I did not look at the clock when I returned. On my return I found my clerk calling Wellow. It is not the practice of station-masters to allow trains to go on unless they get a Keep order from me. They advise me freely of the positions of the trains. I did

not leave the office from 6.30 to 11 p.m. I feel certain that if I had been the Radstock station-master I should not have allowed the up relief train to leave Radstock station without communication with the crossing agent. If I had been checked in the inquiry I should have persisted until I got a reply. I do not think if I had been the station-master at Wellow I should have let the Bath special leave without communicating with the crossing agent. I consider it was his duty to have communicated with me. There was no stop at all in the message "Down over T. up on from T." I remember now a little correction I have to make. At 10.39, after we had sent Radstock a send-on order to send on No. 16 up special to cross No. 7 down at Wellow, it was then Radstock made an attempt to say something. I don't know at all what they were going to say, and I told my clerk, "Stop that, and get the T. A. from Bath," that is the train advice for the down special from Bath. I did not tell you that the other day, because I did not remember it. He did not do it at 10.54, but at 10.39. I knew it could not be the Wimborne special; she could not run the distance from Evercreech to Radstock in 39 minutes. I could not arrange the crossing places in the absence of any information from either the station-master at Radstock or the station-master at Wellow. Hillard's evidence quoted as to what happened at Wellow between 11.15 and 11.18 as to the exchange of signals on the block instruments between him and Foxcote between the two parts of the message "Down over T. and up on from T." is not correct. At 10.39 on the 7th August my clerk Locke was in the office when Radstock was going to say something, and I stopped him. The needle was held over by Radstock, with a view apparently for him to send a message, when I told Locke to stop him and call Bath. There was no one in the office except myself and Locke. I flatly contradict that Radstock was stopped again at 10.55, or that he made any attempt to communicate again after 10.39. If Locke had stopped him I should have been aware of it. The plan produced is a correct plan of my office. Of the five instruments shown as on the shelf on the plan, No. 1 is the post office instrument, No. 2 applies to stations between Wells and Burnham, No. 3 applies to stations between Glastonbury and Wimborne, No. 4 to the principal stations between Highbridge and Wimborne, both inclusive, and No. 5 to the stations between Glastonbury and Bath, and is the instrument referred to in the present case. From 10.51 to 11 o'clock, my clerk and I were engaged with No. 4 instrument in making inquiries as to when the up goods train would leave Templecombe, and sending crossing orders, sent respectively at 10.59 and 10.57 to Wincanton and Templecombe. Whilst Locke was working at No. 4 instrument I was standing close to him, as far as I remember, on the side of No. 5 instrument. I had been writing crossing orders at the table between 10.51 and 10.55. I do not remember doing anything between 10.55 and when the crossing orders were sent. I know I was standing by Locke and near the instruments. At 10.51 Locke had ascertained from Bath ticket platform that the down special had passed there at 10.48. I saw the message sent and replied to. Then I took No. 4 instrument and asked about the goods train. They said, "Ready in a minute," at 10.53. I then told Locke to call Wincanton, and I sat down to write the crossing orders, knowing Locke was engaged with No. 4 instrument. I was sitting sideways to the Bath instrument when writing, and could not see that instrument. It was impossible that Locke could have received anything from Radstock at that time, and replied O.A. without my knowing what occurred. I am not quite sure whether Inspector Wood came into the office or not, but I am sure he looked through the trap. It was shut, and it was about 10.40 when Inspector Wood opened the trap and looked through it. He asked me whether I had any advice of the train from Bath. I replied that I had not. He further said, "If she has not left, stop her, cancel her "running, because there is plenty of room in the "up-trains to take the passengers from Midford to "Bath." He said nothing else in regard to the up relief train. He did not ask any question in regard to her running. I did not ask Radstock after 10.39 what they had wanted to say when we stopped them. I do not think it was necessary under the circumstances. I do not know of the instrument being shaken angrily at Glastonbury when stations persisted in communications. I have told my clerk when sending a crossing order to stop and attend to a station which had called more than once. I do not believe that a station has ever been treated in the way described by Mr. John, when persisting with a message. I had calculated that the up relief train would reach Radstock at 11.15. I made such a calculation after 10 o'clock. I do not know whether I did so before 10.39. It would, I think, be before 11 o'clock. It is 17 miles from Evercreech to Radstock, and a train stopping at every station would take about an hour and a quarter to run the distance. I knew at 10.39 that nothing could then be known of the up-train at Radstock. It could not get near Radstock in 39 minutes from Evercreech. At 11 o'clock I left the office and returned at 11.5 or 11.6, and my clerk was calling Wellow. I took the instrument and went on calling Wellow to 11.12 or 11.13, and what I have before stated as to what followed is correct. There is no written message from 10.39 till 10.55, or any entry, except the train 10.43 in my advice book. If Inspector Wood said he came into the office I would submit to it, because I was very busy at the time. I fancy he said something about my being busy, and he would not then speak to me. My clerk told me yesterday the door of the office was locked, but my recollection of it is not clear now. I may have unlocked the door to let in Inspector Wood, but I do not remember. The door was locked because when we are busy passengers come and inquire about trains and distract our attention. There would be passengers at Glastonbury station on the evening in question. It would be before 10.39 that Inspector Wood communicated with me. I was not interfered with by the passengers or anybody else on that night in doing my work. Mr. Difford was not in my office from 6.30 to 11 o'clock, and I had no communication from Mr. Difford during that time. I saw Mr. Difford at 5.20. I showed him the message I had received from him respecting the up relief train. The substance of the conversation was that the number of passengers required an extra train. I might have told him what arrangements I proposed to make. The communication with Mr. Difford was to the effect that the special train would follow the ordinary 6.10 train from Bournemouth, which train would carry special lights. I also told him that I thought I had better inform all stations of the running of the special in addition to the lights. Nothing passed between us as to its crossings, or as to any precaution to be adopted in regard to it. Inspector Wood does not instruct me in regard to crossing places. I am solely responsible. When Inspector Wood spoke about cancelling the Bath train, I remarked that I thought it would be too late to stop it. We began calling with that object at once, perhaps when Mr. Wood was in the office, but he left immediately. There was no discussion between us as to the arrangements that would be required in consequence of the Bath train being late. In reference to my previous statement, "Generally I only get advices from Radstock after asking," that would not render it the more necessary for me to ask them the position of the up-train on that night, even after they had tried to communicate with me, and I had promised to provide crossing places. When I said "We" in regard to calling Wellow, I meant my office; and it might mean either myself or my clerk. My clerk told me that while I was out of the office from 11.0 to 11.6, he was engaged in calling Wellow, and taking a train advice from Templecombe. I was not in the office when my clerk asked something of Radstock and got O.A. in reply.

Before the Coroner on the 12th September, Mr. Percy gave further evidence as follows :—

Several times before trains have run like the up-relief-train in question, but not the entire length from Wimborne to Bath. For such trains I should be advised by Mr. Difford as to the time of their leaving the starting point. As I am not responsible for making time tables generally I do not consider that I was responsible for making a time table in the case of the up-relief-train. I had never done so before. I did not expect a time table for the up-relief-train from the superintendent.

John Locke (sworn).—I am a telegraph clerk in the service of the Somerset and Dorset Company, and have been so about five years. I have been working with the crossing agent at Glastonbury about two years, having to send such messages as I am directed. I make entries in the Train Advice Book produced by Mr. Percy. There is a clerk who relieves me. There are few persons who make entries in that book. The entries are made at once, as soon as they are received. If we do not receive the times we ask for them, and then put them in. Bath is very bad—the worst. Wimborne is rather bad. When the time is not sent we keep asking for it until it is sent. That has to be done daily. On the day in question I came on duty at 9 o'clock in the morning, and was on duty till 8.30 next morning. I had an hour for dinner and an hour for tea, returning after tea at about 20 minutes to 5, from which time I did not leave the office until 8.30 next morning. We were busy all the evening. All entries respecting the special train that came into collision from Bath, as well as the Bath train itself, were made by Mr. Percy. I took the message at 7.24 from Wimborne, but none of the subsequent messages entered in the book. I was engaged with other instruments. I have nothing to do with the crossing of trains, only acting as I am told. I took the notice of the down train from Bath at 10.43. I thought Bath signalled the train as leaving Bath at 10.23, so I made a second inquiry, thinking, as it was 10.46 when the message was received, there must have been a mistake. I signalled B.A. to the ticket platform at Bath, and got the time of passing there, which was 10.48, at 10.50. We keep a Note Book, where we register delays in consequence of station-masters not advising us of the trains. I was calling Wellow from 10.59 to 11.5, but could get no attention. At 11.5 I began to call Radstock, and they first replied "Good," and left the instrument. I got attention on that occasion in half a minute, and asked "Where's down special?" I called a second time, and asked if they refused to answer my question respecting the down special. They replied "Don't know;" meaning they did not know where the special was. At 11.7½ I called Wellow again until about 11.9, when Mr. Percy began to call Wellow. I could get no attention. Mr. Percy said, I don't remember at what time, "Down is over T, and up left T;" T being Foxcote. I then thought it was all right. Mr. Percy then called Radstock again, and asked where the down-train was, and they told him they did not know, and said the up had left Radstock. We were then alarmed. I hardly know what happened after that. I do not know at what time information of the accident was received. On that night the instruments were in perfectly good order before the accident, but afterwards they could not communicate further than Foxcote. I have seen some of the written complaints of station-masters not reporting trains, and not answering calls. The complaints of the want of attention on being called have been 4 or 5 times a week. There was no one else in the office but Mr. Percy and myself during the whole evening. I produce two books—a note-book used by Mr. Percy, myself, Seymour, and a clerk named Ashford, but on the evening in question only Mr. Percy and myself were in the office. On August 7th nothing material to the accident was entered therein. The other is a train report book. In that book nothing is entered of train reports from Radstock and Wellow, because there are no columns for them. (Mr. Difford explains he established the book to inform himself how the trains were running at certain junctions. He does not consider it necessary to have a book for train advices from all stations, and Mr. Percy, when offered such a book some time ago, stated that it was not required. There would be more trouble than it would be worth.) In the train reports book on the 7th August Mr. Percy made entries that the up relief train left Wimborne at 7.24, Templecombe at 9.17, and Evercreech at 10 o'clock. That the Weymouth train left Wimborne 8.11, arrived at Templecombe 9.34, left 9.47, left Evercreech 10.23, and that Burnham special left Evercreech 9.45, arrived at Bath 11.40. The Bath train was entered 10.23 and altered 10.43 as the time of its leaving Bath. I came back from my tea about 4.45 on the day of the accident. I do not know whether I afterwards left the office, but from about 8.30 to 11.6 I was constantly in the office; I do not remember leaving during that time. I forget whether I asked Radstock any verbal questions during that time. I sent a crossing order at 10.39 to Radstock, and it was then that they attempted to ask a question, and Mr. Percy, as he stated in his evidence, told me to leave it and ask for a T.A. from Bath. I expect I gave Radstock S.R. It would be about 10.39. I am perfectly certain it was not later. I know I did not give Radstock O.A., as stated by Mr. John, at 10.55. I was in the office at 10.55. There were crossing orders coded 10.55 to Wincanton. At 10.39 I had no other communication with Radstock than the order referred to. When I stopped Radstock, they had only held over the instrument, and had not said a word. It does not very often happen that people are treated like that when they want to telegraph. I was engaged till 11 o'clock sending orders to Templecombe and Wincanton. There are five instruments in our office, and I can say that no one was calling from 10.50 to 11 o'clock. What Mr. John said must have been untrue in regard to being stopped about 10.55 in a question to Glastonbury. The next communication with Radstock was 11.6. I had been calling Wellow from 11 to 11.5. At 11.6 I asked Radstock "Where is down special?" and they said "Good." There was no interruption to me in giving that message; but I gave the whole message, "Where is down special?" twice, and John gave me O.A. If John stated he stopped me twice when I got as far as "Where?" his evidence is incorrect. When John had given me "Good" to the two first messages, I asked, "Do you refuse to answer my question?" and his reply was "Don't know." I am quite certain he did not say the up special had passed. There is a difficulty in working the Bath instrument, owing to the business on the circuit. Sometimes it occurs on all the instruments, but more often on the Bath instrument. As far as I can remember, I was the only person in our office who sent a message between 10.50 and 10.59, when Mr. Percy called Wellow. I do not remember any difficulty with the crossing of trains on the 5th of June Bank Holiday of 1876. We have been busier than we were on the 7th August. Sometimes the trains have been delayed a few minutes at such busy times. I know I was engaged on Wimborne through instrument and other instruments from 10.50 till 11 o'clock. I did not touch the Radstock instrument during that time. I cannot say positively whether Mr. Percy did or did not do so.

Mr. Percy here stated: There are 11 stations on that circuit; it is possible that any one of them might have received the message, and given O.A. The 11 stations are Bath, Bath ticket platform, Midford, Wellow, Midsomer Norton, Chilcompton, Binegar, Masbury, Shepton Mallet, Evercreech Village, Evercreech Junction. Any one of these may have pretended to receive a message from Glastonbury, and to have sent a reply.

John Locke resumes.—I remember Mr. Wood coming into the office about 10.30 p.m. or 10.40 p.m. on the

night of the accident. It was before we finished sending the send-on order to Radstock. I know the door of the office was locked all the evening before Mr. Wood came in, but I cannot remember unlocking it for Mr. Wood, who I believe was the first to enter the office. He asked Mr. Percy if the down special had left Bath, and Mr. Percy replied it had not left. Mr. Wood then said, "Better cancel her, there will be plenty of room for the passengers in the up-trains." I do not remember anything else passing. I know that Mr. Wood left the office before we commenced to call Bath with that object, and before we finished sending the send-on order to Radstock. About four or five minutes before Mr. Wood came into the office, he spoke through the trap. He was going to ask Mr. Percy about the down-train, but seeing he was busy he said, "All right; go on," and came into the office a little later. That was all he said through the trap. Mr. Percy told me to stop the message at 10.39. I know nothing about the attempted message from Radstock at 10.55. About that time I was calling Wincanton, to send them a crossing-order. Mr. Percy was then writing the orders. I did nothing between the time when I was engaged with Bath ticket platform and when I began to call Wincanton. The crossing-orders above referred to were written about two minutes before they were sent. I did not leave the instruments between 10.51 and 11 o'clock. I was engaged with No. 3 and No. 4 all the time. It is impossible that Mr. Percy could have given the O.A. to Radstock without my seeing it, but he might have done it without my remembering. I did not give the O.A. myself, it would be impossible for Mr. Percy to give it without my seeing it, and it is possible he may have given it without my remembering it. Mr. Percy took the message from Wellow himself. I was standing at his left hand, and am able to say from hearing him read it off that it was one continuous message, and that there was no break in it. I have never shaken up the instrument angrily, as described by Mr. John, nor have I seen it done by any one else. Mr. Percy is rather particular in seeing and hearing what stations have to say. Radstock very often advises us of trains without our asking them. They send train-advices with and without our asking them about an even number of times. About 10.40 we called Bath for two minutes, and after waiting we called them again, and they gave us a T.A., which I took as 10.23. Mr. Percy said it could not be 10.23, so I telegraphed to Bath ticket platform, and found it was 10.43. It is our practice if a station tries to get our attention and is checked, not to ask them afterwards what they wanted. I never knew a case of stopping a message by O.A. until that at 10.39. I am sure they were not stopped again by O.A., but I may have stopped them again by S.R. when calling Bath between 10.40 and 10.45, but I do not remember doing it. I might have done it, because I was already working at the instrument on which the call would come. I know I could not have done it later, because I was at the Wimborne instrument. Mr. Percy went out at 11 o'clock. I did not notice the time when he came in again. I knew the up-train left Evercreech at 10 o'clock, and the down-train left Bath at 10.45, but I was not anxious about the up-train even after Radstock's attempt to get attention.

Alfred Dando (sworn).—I have been signalman in the employ of the Somerset and Dorset Company since the 13th June this year. I have been all the time at Foxcote. On the 20th of last May I went to Glastonbury to see Mr. Difford, and on the following Monday I was taken on as a porter at Radstock station. From the time I became a porter I was allowed to go when I had time to the Radstock signal cabin to learn signalman's duties. I went nearly every day into the cabin, but did not touch the instruments or levers. I tried some of the levers, but was not strong enough to move them. I do not remember having ever touched either block or speaking instruments in the cabin at Radstock. My hours, when porter, were from 7.30 a.m. to 7.30 p.m. one week, and another week from 8 a.m. to the last up passenger train due at Radstock at 9.25. p.m. I went into the Radstock cabin daily until the afternoon of Tuesday, the 13th June, and was learning till the following Monday, when I began to learn the duties at Foxcote cabin. I cannot take a message or send one on the single needle telegraph instrument. I can read and write, but I cannot write well nor read excellent. Everything went smoothly to the time of the accident. I only had occasion to use one signal-lamp at night, except when a special might come from Bath. That lamp was on the up home-signal post. We have late trains going up but not down. The up distant-signal would be lighted from Radstock if lighted at all, but I do not know that it was lighted. The down train from Bath passed me at 8.37 on the 30th June. The Line clear book produced was at Glastonbury during July, and we had another for the time. I begin duty at 6.5 a.m., and keep on till 4 p.m. I am then relieved by my mate until 6.5 next morning. The man on night duty waits until the last up goods train passes; on one night pointed out it was 12.20, another, 1.36, again, 12.28, 1.39, 12.20, 1.0, when it passed. The first I would hear of a train approaching me is "Line clear" being asked either from Wellow or Radstock, then I give three beats to the right, "Yes, line clear." They say "Train will start" by three beats to the left, and then I pin my needle over to the left, which means "Train on line." When the train has arrived I signal four beats to the right, having, when Wellow or Radstock has said "Train will start" telegraphed for "Line clear" to the other, and if it be not received, stop the train by red flag or red light. I can see the up-distant signal by day, but I have never seen it by night. It is lighted by people at Radstock. If they give me trains from Radstock and Wellow at the same time I would block the line by six beats to the left. The train from Radstock was the first I heard of when I had "Line clear" at 11.2 from Radstock I gave three beats to the right "Yes, line clear," and it came on to my signal cabin. A previous train going towards Bath was not off block at Wellow, and I stopped the other train near my cabin in consequence, by showing a red light with a hand-lamp, in addition to the signal-lamp of the home-signal. I do not know whether the distant-signal lamp was lighted. I brought the train from Radstock to a stand a little past the home-signal and close to my box. I then waited till they unblocked from Wellow, and when they signalled the arrival by four beats to the right, I replied with four beats to the right. Then I asked "Clear for the train" which was standing at my cabin, and obtained "Yes, line clear," by three beats to the right. Then I signalled "Train will start," and they gave three beats to the left to signify line blocked, and pinned their needle for me to send my train on. I showed a green light with my hand-lamp to the engine-driver, and he started as soon as he could. The next thing that happened was that this train came in contact with the other train. The first thing I heard was the shock of the collision. My signals were against the down train. I lighted the home-signal lamp myself when I thought it was getting dark and enginemen might not see the arm. I put the lamp in the box and pulled it up. It was alight at the time of the accident, and immediately afterwards. I had only once before lighted that lamp, which was for a special train. I got no messages after the accident. I am certain that at the time of the accident my needle was pinned to "Train on line." I know nothing of crossing trains. We are supposed, if we have "Line clear" from Wellow or Radstock, to let a train go on to the other place. I look for the lamps and flags of passing trains. I cannot say whether there was any such signal on the Radstock train. The previous up train to which I refer is marked wrongly (*special* 13) in the book. I gave "Line clear" for it at 10.44 to Radstock. Radstock gave "Train will start" at 10.44, and I gave "Train arrived" at 10.48., but the train ran past my cabin nearly to where the collision took place that

subseqnently occurred. The train was backed, however, and at 10.48 I entered its departure. The arrival at Wellow was signalled back 11.4. I had previously entered 10.58, which was a mistake in my looking at the clock; I cannot account for it in any other way. I made the correction immediately. I stopped the train which I marked as arriving at 11.5, because I had not got "Line clear" for the Burnham train till 11.4. I put down in the book "Collision took place 11.6½, W. took on the train for Wellow 11.6," before 12 o'clock the same night. The Radstock train stopped at my cabin four minutes before I let it go on. I am certain Wellow did not ask to send on a train before the Radstock train arrived. I was 20 years of age on the 19th May last. I receive 15*s.* a week wages. I had no oil for my distant-signal lamps on the night of the accident. It had not come from Highbridge. I put the last of my oil into the home-signals' lamps. If I had had oil I should have lighted the lamp of the distant-signal towards Bath. I had not lighted that signal-lamp before. The latest train from Bath is usually 8.16 from Wellow. I had instructions to light the distant-signal lamp, but could not carry them out that night as I had not enough oil. When we want oil we tell or write to Mr. Jarrett, Radstock station-master, and we put a label for it for Highbridge on the can, and then we put it on the bank engine and that takes it to Radstock. I had a difficulty on the night of the accident in attracting the attention of Wellow on the telegraph instrument. I was about two minutes getting it. I wanted to get "Line clear" for the train from Radstock, which had come to a stand at my cabin. The last communication before then that I had had from Wellow was when he signalled the arrival of the Burnham special. It was directly after Wellow announced the arrival of the Burnham special I began to call them as above. They had not announced the arrival of the Burnham special before the train from Radstock reached my cabin. It was about four minutes after the arrival of the train from Radstock that Wellow announced the arrival of the Burnham train. As soon as I asked "line clear" I got it. The train from Radstock would therefore have been standing six minutes at my cabin. I got the arrival of the Burnham train from Wellow at 11.4. I should not like to say that I told anybody after the accident that I could not attract the attention of Wellow. I cannot say whether I did or not. I lighted the up home-signal immediately after train No. 16 goods had passed. I lighted that first, and the home-signal towards Radstock afterwards. The oil I put in the home-signal lamp on the night of the accident was a very small portion. The lamp was burning brightly when I pulled it up to its place. I did not see it again. I put into the lamp all the oil I had. I cannot say that I told Mr. Jarrett I was so confused and frightened that I did not know what I was doing on the night of the accident. I may have said so. I am aware of nothing that confused and frightened me before the accident. I cannot remember omitting to give the beats to signal arrival. It does not happen very often that my arrival beats are not acknowledged. Wellow and Radstock most often give the beats to signal the arrival of trains. I wrote "special 7" in my "Line-clear book" because I was expecting that train, the Bath train. I wrote it at 8.46, after signalling a down goods train. I had lighted my signal lamp, as I think, before the 8.46 train went through. That was the down train previous to the Bath train. I made the written statement produced after the accident, and signed it. I wrote it after Mr. John came into the cabin. I cannot tell when. I think John came alone to my cabin, and told me to make a note of it. He was present when I wrote, but he did not tell me what to put, and I did not show it to him afterwards. I am sure I wrote it myself without consulting John. I put it in my pocket until the policeman (Furze) came, to whom I gave it. I guessed the time at which the collision occurred, and the half minute is obtained by the time allowed after the up relief train had been started by me until the collision occurred. The 11.2, the time the Wimborne train was sent from Radstock, I put in when it was signalled, but the 11.5, 11.6, 11.6 I put down when told to do so by John. He did not tell me what figures to enter, only to put down my time if I had not done it. I wrote the memorandum after putting the note at the bottom of the page in the "Line-clear book," which also I had written at John's suggestion. The memorandum was written before the constable came in. I knew we had to put down in the book any irregularities that occurred during the day, but I did not know we had to make a report such as the memorandum. I first entered the figures at the top of the page, I secondly made the memorandum at the bottom of the page, and thirdly the memorandum on the separate paper dated 7th August 1876. John told me to make a note of it, and then I wrote the longer memorandum after the note in the book. I made no rough copy of the memorandum; I only wrote what is produced, and that is the original.

James Sleep (sworn).—I am a station-master in the service of the Somerset and Dorset Railway Company at Wellow, and have been so about 10 months. Before then I was a signalman at Evercreech junction for about six months. It was then that I joined the service of the Company. I am pretty well acquainted with the regulations; I work by them occasionally, sometimes in the absence of the telegraph clerk, and sometimes when he is present. The single line arrangements for the working of trains are attended to chiefly by the telegraph clerk. I receive 23*s.* a week pay, and the uniform. I was at the station when the present collision occurred. Previous to that I had been off duty since 6.30 p.m., having come on duty at 5.30 a m. At 6.30 I left duty altogether, and the telegraph clerk and signalman were in charge of the station. The telegraph clerk only was in charge of the single line arrangements and the telegraph instruments. His name is Arthur Hillard. He has been at Wellow a few days longer than I have. I was present some time after 11 p.m. I do not know exactly when the down special from Bath arrived at Wellow. That train had to cross two other trains at Wellow. I came from Midford by that train. I made inquiry of Hillard on my arrival, and he referred me to the telegraph written messages he had received in regard to the trains. I produce the messages in question. A. received 7.56, B. received 10.4, C. received 10.24, D. received 10.40. I obeyed those messages. I did not receive any other telegraph messages. I gave the authority to the guard for the down Bath special train by which I arrived, to leave Wellow after a detention of about three minutes, to start for Foxcote. The position of the trains was this: The up ordinary goods train was standing at the station in front of the up Burnham special, which was standing on the Radstock side of the Wellow home-signal. In order to get this train inside the signals we had to move the up goods train forward off the loop in the direction of Bath; then the Burnham special came on to the loop where the goods train had been standing. Whilst the Burnham train was standing outside the home-signal, the block had been kept on to Foxcote, and as soon as it was brought on to the loop I told Hillard to signal her arrival to Foxcote, and to obtain "line clear" for the departure of the Bath special, and to start that train. I did not see the signals pass. I was standing opposite the signal box, and Hillard was, as far as I remember, just behind me. He would have to go into the booking office to work the instruments. He appeared to go in for that purpose. I did not go in with him. As he came out I met him at the door. I asked if it was all right, and he replied "Yes." That was all that passed between us at that time; and I stepped into the office myself. I saw it was all right to start the train, as Foxcote had blocked the line; the needle of the instrument was blocked over to the left, as if for that purpose. I saw that, before the train was started. I said nothing to the engine-driver. I knew of the

relief train from the telegrams, and also from seeing a double red light on the up ordinary passenger train, which indicated "special to follow." According to my rules I had nothing more to do for the Bath train. The up ordinary train referred to (No. 18), according to my book, reached Wellow at 10.3, and started again at 10.7 (?) I heard Mr. Difford's evidence. I think that, under the rules, I was right in despatching the Bath special as I did. It was according to my usual practice. The up Weymouth train was due at Wellow at 10.32, when I despatched the down Bath special. That would make no difference in the opinion I have already given, unless we had been advised by the crossing-agent at Glastonbury. The Bath special would have to cross the Weymouth train at some place not indicated in the time table. Rule 14 referred to. I consider that rule would apply only to ordinary trains running out of their usual course. I do not take it to refer to the case in question. The train from Bath upset the working arrangements for that evening by being late. According to the time table the Bath and Weymouth trains had not to cross, so they do not come under the letter of rule 14. Glastonbury should have advised me if the up trains were not running in order. In regard to the relief train, I trusted entirely to Glastonbury, who had promised to arrange the crossings. I should not hear about the crossing if it were not to occur at Wellow. I was not in the office, and I can give no account of Mr. Percy's complaint that his calls were unanswered from 11.0 p.m. to 11.13 p.m. I had been to Midford chiefly for pleasure, and I was off duty at the time. The trains appear to have met owing to a misunderstanding, and I attribute it to the crossing arrangements; but they could not meet without a mistake on the block, either at Wellow or Foxcote. I have an idea as to how the accident occurred, but I decline to say what it is, because it might implicate me. When I looked at the instrument on entering the office, I did not notice whether the needle was calling Wellow. I think I should have noticed if they had been calling "W" for Wellow. I must have heard it. A man attends to the clocks twice a week. He says on the platform, without always seeing the clock, it is such and such a time. We sometimes ask the time from Glastonbury. I supposed our clock to be right on the day of the accident. After the Bath train left, Hillard and myself went out of the office together; it would be about 11.10 or 11.12 p.m. I heard Mr. Percy calling about 11.15 or 11.16 when I returned to the office. He asked, "Where is down special?" It was not a coded message. I answered, "Down special over T"; the clerk did it under my instruction. I had no other message afterwards from Glastonbury. About 11.20 or 11.21 the telegraph wires became entangled. I examine and sign the "Line-clear book" every day. After the down Bath special started I was in the office, and heard the telegraph clerk working the instrument. I turned round and inquired what he had done. I found that he had blocked over the instrument for a train from Foxcote. I remarked to Hillard and two goods guards who were in the office, that the down train could scarcely have got to Radstock in the time. I do not think I looked at the book at that time. The train would probably run from Wellow to Foxcote in six minutes. According to the book produced the Bath special left Wellow at 11.10 for Foxcote, and the up relief train was on from Foxcote at 11.18. Thus, eight minutes had elapsed from when the Bath special left until I observed that the other train was on from Foxcote. It would take two minutes more for the train to run from Foxcote to Radstock. The needle of the block instrument in my office remained pegged over to the left as for a train from Foxcote after the collision. I did not see Hillard ask for "line clear" for the up train from Foxcote. The Wellow needle applying to Foxcote must have been released too soon, before the Bath special reached Foxcote. I do not know whether Hillard asked for it to be released, or whether it was done without his request. Nothing passed on the speaking instrument between Wellow and Foxcote. The first thing I saw between the blocking to Foxcote was the blocking from Foxcote. I saw the needle vertical between those times; and while Glastonbury was asking "Where is down special?" I would naturally look round to that question, to see whether the down special was "Over T;" and when we replied "Over T," we meant it had actually passed Foxcote. I told Hillard to send that reply, and Hillard did it, as far as I know. I told Hillard to send the message that the down Bath special had passed Foxcote, taking it for granted that it had done so from the upright position of the needle. We had received no notice by arrival signal that it had passed Foxcote. I added immediately to the message "Down over T" to Mr. Percy, "Up on from T," sending it because I saw the needle vertical. I think that while Hillard was sending to Glastonbury "Down over T," he received notice of the up train from Foxcote. I added "Up on from T" on seeing that the needle was blocked. It was just after both parts of the message had been sent to Mr. Percy that I made the remark, "I should think that train had not time to leave Radstock." I am not sure that I saw the needle vertical, as stated above. Foxcote asks "line clear" from Wellow as soon as he is asked "line clear" from Radstock, and thus a train may be only leaving Radstock when Foxcote asks for "line clear." My telegraph instruments have been working well. I cannot say for certain whether, on my arrival from Midford, and on going first into the office, the state of the block instruments. It was about two minutes afterwards, when I had been out and returned again, that I noticed it. The instrument was then blocked as for a train to go to Foxcote. I saw the pin was out, and the instrument blocked over; I am perfectly certain. Within a minute I started the train, and the needle had then been pinned over from Foxcote for the train. I went into the office for the purpose of seeing if Foxcote had pinned over for "train on line." I asked the boy Hillard if all was right before I saw the needle. I went in specially to see the state of the needle, and started the train on my own knowledge. The next thing I saw on the instrument was about 11.18, when I saw that Hillard had blocked for the up train. I am governed by the "Line-clear book" as to the time. It was then I said I thought it was quick for the train to have reached Radstock, and the up train to have come on. My opinion is that the man at Foxcote was confused, and did not know what he was doing. He is inexperienced for an emergency, and might have unpinned our needle. I do not remember whether I told Hillard to send to Glastonbury the message, "Down over T." When the needle is vertical I take it for granted that a train has arrived. What I meant the other day when I said the accident might have occurred through the crossing arrangements was, that if Radstock and Glastonbury had been in proper communication, the up train ought not to have left Radstock. It was when I returned from the accident that I noticed the "Line-clear book." The figures were 11.15 when I saw them, and the blot was there. I think Hillard is pretty accurate in making his entries. He may make a mistake. I should think Hillard was absent about four minutes, when he went to collect the tickets; it is quite possible that he should collect them in that time.

(*Hillard* says he sent the messages "Down over T" and "Up on from T," and Mr. Sleep was there; but he does not know whether he instructed him to send them.)

Sleep continues: I had intended going to bed when I returned from Midford. I remained at Wellow station for some minutes after the down train was signalled at Foxcote. It was some time between 11 and 12 that I went towards the scene of the accident. It was about 11.20 or 11.21 that I noticed the speaking instrument working very strong. I did not go at once down the line. I stopped about the station doing nothing. I do not think I noticed the line clear

book before I left for the accident. I am certain did not do so. I went to the signal-cabin at Foxcote about 10 minutes after arriving at Foxcote. Dando told me, "You sent train on without line clear;" and I replied, I had not done so. (Dando remembered seeing Sleep there, but nothing of what passed.) Mr. Jarrett came into the signal-cabin while I was there. I met a passenger between our home and distant signals who said there was a smash. I cannot say why I stopped at the station, but it was not because I thought there might be an accident. I might have gone to bed if I chose. I might have stayed there for gossip. I had no other reason to remain. When I said I thought the Bath train had run very quick, I did not think there would be an accident. I did not realise when the messages "Down over T, up on from T" were sent, that a collision was impending.

Arthur Hillard (sworn).—I was 15 years of age in October last. I receive *7s. 6d.* a week. My hours are from 8 a.m. till after the passing of the last up passenger train, due at 9.34 p.m. I am generally on duty from 8 a.m. till 10 p.m., with a holiday on Sunday. I am a telegraph clerk at Wellow, in the service of the Somerset and Dorset Railway Company. I am in charge of the telegraph instruments, and when the station-master is away I am jointly with the signalman in charge of the single line arrangements. I have to take messages and crossing orders, and to tell the engine-drivers whether they are to go on, out of course, by giving the drivers the crossing order. If I get a "Keep train" order I keep the train. The signalman does not interfere with this, his duty being confined to the points and out-door signals. Formerly, for two or three months, I had to be on duty from 5.15 a.m. to 7.30 p.m. I was not able to get up every morning at the proper time. My landlord called me. I never drop asleep over my instruments during the day, nor felt confused. I prefer coming on duty at 8 o'clock. On the day of the accident I came on duty at 8 o'clock, and was still on duty at 11 p.m. I have been telegraph-boy, and learning, for about three years. The station-master was off duty from 6.30 p.m. on the day of the accident, and I was in charge with the signalman (William Gillard). The signalman did not assist me, being otherwise engaged. I received the four messages, A, B, C, and D, already put in by Sleep. I told Mr. Sleep of the messages when he arrived at the office, and asked what arrangements were made. He then went out to let the Burnham special pass the up goods train. I should have had to manage them if he had not come back. I think I should have sent the goods on first to Bath before the Burnham special. Mr. Sleep brought the Burnham special to where the goods train had been, and told me to announce to Foxcote its arrival at Wellow, and to ask Foxcote for "Line clear" for the down Bath special by which he had arrived. The needle when I went to it was blocked for the up special. I took out the pin, announced to Foxcote the arrival of the Burnham special by four beats to the right, and then gave him three beats to the right for "Is line clear?" He repeated this, signifying "Yes." I then gave him three beats to the left, signifying "Train will start." He immediately pinned over the needle to the left for "Train on line," and I put down 11.10, the time of the departure of the Bath special. I was going out to tell Mr. Sleep that it was all right for the Bath train to start, when I met him in the doorway. He said, "All right down?" and I said "Yes." He went out and started the train. I then went out to collect the tickets of the passengers by the down train. I always have to perform that duty. I also book the passengers when the station-master is away, and when the porters are away I help with the luggage; but I never work the signals and points. It took me two or three minutes to collect the tickets. I came back to the office and cancelled the tickets with the punch. When I had done that, I looked round and saw the Foxcote block-instrument in an upright

special-relief-train from Wimborne. "Line clear" was asked for it from Midsomer Norton at 10.35; it was put on block at 10.46, reached Radstock at 10.58; asked "line clear" to Foxcote, which was given at 10.58, left Radstock at 11.2, and Foxcote signalled arrival at 11.5. At 10.58 Midsomer Norton asked "line clear" for the Weymouth train; at 11.19 it was put on block, at 11.29 arrived at Radstock. No signal was made forward to Foxcote in regard to it, because I had heard of the accident. I heard the engines whistling, and thought there was something wrong. I ran down to the office and found Eglon, the telegraph clerk. I asked him if there was anything the matter. He said there was, and that there was a collision somewhere, but he did not know where. I ran back to the box, where I was obliged to remain. The last down-train I had on that day was No. 18 ordinary goods, which left Radstock at 8.49. I cannot account for the figures scratched out under the heading of "down-trains" special, 9.29, &c., except by supposing that I must have entered an up-train in the down column, and corrected it later. I lowered the signal for the up-relief-train to leave Radstock at 10.58 or 10.59, but she did not leave until 11.2. I had orders from Mr. John to let it go on. He had called to me in the box, and said it was the 7.10 special coming, and I was to let it go on. I asked him if there was not a crossing-order required. He said, "No, it was not "necessary as Glastonbury was going to arrange "crossings." Nothing more passed, except that I said "all right." I took that as sufficient to let the train go forward. I think that while it is necessary to have crossing-orders for advertised trains, it is equally necessary for a train not advertised to have crossing-orders. I think the regulations require it. I mean No. 12 rule. I had no power to refuse to allow the train to go without a crossing-order. When a train has left me and reached Foxcote they unpin and give four beats. They omit the beats sometimes, but very seldom, and simply let the needle become vertical. Dando works with me generally at Foxcote, but the change of duty is there 4 p.m., while the change of duty at Radstock is 2.30 p.m. I do not find any difference in the working of the two men at Foxcote, and I could not tell whether I was working with Dando or the other man, so far as the mode of working is concerned. Now and then, when I have had to run down and tighten or slacken my wires, I have come back and found my needle vertical. I have no other duties to take me from my cabin. The practice referred to has not happened from Midsomer Norton; only from Foxcote. The arrivals at Midsomer Norton are signalled by shaking the instrument up, and giving one beat of a bell with the needle standing vertical. I do not know how that mode of working arose; it is not provided for in the regulations. They generally give the beats from Foxcote for arrival of trains, but they never do so at Midsomer Norton to us, nor we to them. I found that mode of working in operation, and have continued it for 14 months. I have never had any instructions to work in that way. I saw it so done while I was there learning, and continued it. I never communicate with Wellow direct. Relieving-signalman Francis has seen me work in this way. Wood, Ashford, and Jarrett are our inspectors. I cannot say they have seen me working in this way. I have done this when they have been in the box. I do not say when Wood and Ashford have been there. In what I have said in regard to the signalling of arrivals at Foxcote, I mean that I have been content to see the needle unpinned without hearing the four beats, and Foxcote has been satisfied without an acknowledgment. That has only occurred four or five times in the 14 months I have been in the cabin. I take Mr. John's order to start a train just as I would the station-master's, because he acts for the station-master in his absence. I could not leave my box to consult with the station-master; the trains were too thick. My cabin is about 100 yards south of the station. I have nothing to do with speaking instruments. My duties are to attend to the block instruments, the signals, some points, and the gates of the level-crossing, which are worked from my cabin.

Horsey, *Dando*, and *Hillard* appeared together and produced their books. In regard to the Burnham train Horsey asked for "line clear" to Foxcote at 10.40, and Dando has 10.44 as the time when "line clear" was asked. Next Horsey has noted arrived at Foxcote at 10.45. Dando has arrival timed 10.48. Dando asked "line clear" to Wellow at 10.48, and Hillard has the same time. Dando has arrival at Wellow 11.4, and Hillard 11.10. In regard to the 7.10 special-relief-train, Horsey asked "line clear" at 10.58, Dando has 11.2. Horsey had arrival 11.5 and Dando agrees with him. Dando asked "line clear" for it to Wellow at 11·6 and Hillard puts it at 11.18. Dando has time of departure 11.6 when he had obtained permission, and Hillard 11.18 as the time that he gave permission. Dando states that he put down 11.6 the time that the up relief-train left him after the accident occurred. Hillard states he asked "line clear" for Bath special at 11.10, but Dando denies it and has no entry of it. Hillard also has 11.10 as the time when he received permission from Dando, and Hillard says it left him at 11.11, of which Dando has no entry. Horsey heard nothing about that train. Hillard has nothing but his entry to prove his case. Dando says he knew nothing of the down train, and that the needle was blocked from Wellow when he sent on the relief train. He also states that Hillard must have sent a train on to the blocked section. Dando says he was alone in his cabin. Hillard thought he was alone. Neither Dando nor Hillard can explain how the accident occurred. Hillard points out the figures 11.10 when he asked "line clear" to Foxcote for the Bath special, and 11.15 as a minute before the time when he saw the needle vertical for the arrival of the Bath special as he thought at Foxcote. Hillard states Dando asked "line clear" at 11.18 which he granted, having seen the needle vertical at 11.16.

William Gillard (sworn).—I am a signalman and porter at Wellow station in the service of the Somerset and Dorset Company and have been so since the 12th June last. My duties are to look after the points and signals and porters. I work in a cabin. I work the block instruments in the station from 9.30 p.m., or after the passing of the last passenger train till 2, 3, or 4 o'clock in the morning according to the running of the trains. I was on duty at Wellow on the evening of the 7th August. I saw No. 7 down special come from Bath. It arrived about 11 o'clock. I could not see the clock. I remained in the signal-cabin to work the points and signals for the up goods train and the Burnham special. The Burnham train moved into the loop, and the Bath train moved away, and the goods train came to its place. The Bath train left immediately the Burnham train entered. The station-master passed my cabin on his way to the office, and said nothing to me. I saw him go into the office. After he passed my cabin I heard him say to the telegraph-clerk Hillard at the door of the office, which is within three feet or so of my cabin, "Take off the up train and put on the down train." I heard him say those words. He stepped into the office, and looked at the instruments, and said to me "Pull the starter for the down special." That was after he looked at the instruments. He was then standing in the doorway of the office. I was looking through the window at that end of the cabin, as I had been all the time. I pulled off my starting-signal, and the down special train ran out. The up special was then waiting to go. Still standing at the door after the Bath special went he said "Pull the starter, and let the up special run away." I pulled the starter off, after getting the order, and the up special went. The station-master was still in the office. The goods train had backed in before the up special could go. I could see the station-master turn his head towards the instruments

the second time, after he had given the order to start the Burnham up special. I remained in my cabin and he in the office until the goods train followed the up special to Bath. When the goods train got outside the starting-signal I left the cabin and went into the office. I do not know what time it was. The first time I looked at the instruments I found the instrument pinned over from Foxcote for another up train. It was on hearing a whistling that I looked at the instrument. The whistling began as I was passing to the office. I did not go into the office before the two guards of the goods train had left. I heard no remark from either of them. It would not take the Burnham special quite so long to go to Midford as it would take the Bath special to get to Foxcote. It did not strike me at the time that it was very quick for another up train to have been put on from Foxcote. The station-master, myself, and the telegraph-clerk remained in the office for half an hour. We were doing nothing, perhaps talking, but I could not say. The whistling continued for half an hour, and the station-master at the end of the time said he would go down the line to see what was the matter. Hillard and I remained in the office all night, and till between 6 and 7 o'clock in the morning. I was not talking to the goods guard Upward in the office that I am aware of, nor out of the office. I did not hear him say how quick it was for the down train to have reached Radstock. I might have spoken to him, but I do not remember what I said.

Edward Mullins (sworn).—I am a goods guard on the Somerset and Dorset Railway, and have been so two years. On the 7th August I was employed in working the Burnham excursion train. I left Burnham at 8.2 p.m., reached West Pennard at 9.15, where we waited 10 minutes for a crossing-order. Glastonbury had not sent the order. We arrived at Pylle at 9.35, and crossed the train No. 10, for which we had got the crossing-order at West Pennard. At Pylle I do not know whether the driver got a crossing-order. At Shepton Mallet we crossed No. 18 down. I reached Radstock at 10.48, and left at 10.50, with a crossing-order to cross No. 7 down special at Wellow. We arrived outside Wellow signals at 11.2 by my watch, which three days afterwards was four minutes fast. I had set it by Bath that morning. We were kept outside Wellow signals for 11 minutes, arriving at the station at 11.14. I did not notice the clock at Wellow station. The Bath train could not have left until after 11.14. We were checked by the signals at Foxcote. The driver ran past the box, and was reversing to come back, when I stopped him by the red light, and gave him the green light to go right away, because I had seen a green light from the signalman at Foxcote. We ran into the loop at Wellow at 11.14, and left at 11.15. I saw the Bath train coming in, and saw the station-master on the platform after we got into the station. I did not go into the office. I did not see the station-master go into the office before he started us away. I know Hillard; I did not see him at that time. The Bath train only waited for us to get clear, and then went away, after waiting three or four minutes at the station. I got to Midford at 11.21, and away at 11.23.

George Upward (sworn).—I am a goods guard in the service of the Somerset and Dorset Company, and have been so about 18 months. On the 7th August I reached Wellow at 10.45 p.m. with No. 16 up goods train, and waited there to pass No. 7 down special. Our train waited on the loop opposite the up platform. While waiting I talked to signalman Gillard and telegraph clerk Hillard. I asked Gillard whether the down special had left Bath. I saw that train reach Wellow about 11.13 or 11.14. I was on the up platform at that time. I did not look at the clock until we left at 11.22. The Bath train left before that. She was about two minutes at the station—no more. When the Bath train arrived at Wellow, I saw the station-master run across in front of the engine of the down train by which he had arrived. He met the lad Hillard outside the office close to the door. The boy Hillard said to Sleep, "The up Burnham is outside the signals waiting to come in." I did not hear him make any reply to the boy; but he said to me, I was to get my train up over the points to allow the up special to run up to the platform. I then went towards my engine-driver and told him what to do, and I cannot say whether Sleep or Hillard went into the office at that time. I myself had gone into the office when I arrived at the station at 10.45. As soon as I got into the office I saw Hillard unblock the needle to Foxcote for the arrival of my train. Hillard had asked me "Is train all in?" before he unblocked. I next saw Foxcote ask "Clear and put on No. 16 up special," and I almost immediately left the office and saw that the needle was then pinned over at Wellow for train on line from Foxcote. When I went again to the office was after the Bath special had left for Foxcote and the Burnham train had left for Bath. That was about 11.19 or 11.20. Mr. Sleep and Hillard were at that time in the office, and guard Cooper was standing outside the office. I looked at the instruments. Mr. Sleep said to me, "The next up special will pass you." I asked him for why, and he replied, "She is now on block from Foxcote." I rejoined, "I did not think it was possible; she could not be there in the time." He said, "Come in and see for yourself." I went in and saw the Foxcote block instrument with the pin in, pegged over to train on line. I said, "If the Bath special has got to Radstock she must have been very quick, for the Burnham special had not got to Midford." I was waiting for the Burnham train to get clear of Midford, and I knew that the Burnham train ought to get to Midford before the Bath train could get to Radstock. I said to Mr. Sleep, "I am afraid, if that is the case, there will be something wrong." He only replied, "She has not been gone very long." I then heard a whistling, and said, "She is now whistling off Foxcote signals." By that time the Burnham special was cleared from Midford and we started with our train. I was not in the office and did not see the Bath train telegraphed to Foxcote, and I cannot say whether Mr. Sleep went into the office before sending that train away. I did not hear of the collision till next morning, and was not much surprised after what I had seen.

William Cooper (sworn).—I am a breaksman in the service of the Somerset and Dorset Railway Company, and have been so for 10 months. I reached Wellow on the evening of the 7th August with last witness. Our train stopped in the loop till the Bath special arrived, and I was standing against the van when it arrived. I did not go to the office until after the down special had left. I did not note the time. I heard Mr. Sleep, speaking to me and the guard, say, "It strikes me that the up special will pass you." Both of us replied the down could never be over Foxcote yet, because she has not been gone long enough. I said the Burnham train ought to be over Midford before the Bath train was over Foxcote. I stood then between the signal-box and the doorway of the booking office. Sleep said to us, "Come and see for yourself," and I went in and saw that the up train was on the line from Foxcote, the needle of the Foxcote instrument being pinned over to the red for train on line. The pin was in the instrument. Two or three minutes afterwards the Burnham train was cleared from Midford, and we started for Midford. I heard of the collision next morning. I was hardly in the office a minute altogether.

Joshua Bishop (sworn).—I have been for two years an engine-driver in the service of the Somerset and Dorset Railway Company. On the 7th inst. I left Bath at 10.10 a.m. for Templecombe. On arriving at Templecombe at 2.40 p.m. I received verbal orders from inspector Carter to run with the engine and van

to Wimborne in the ordinary course of a passenger train due to leave Templecombe at 4.5. I left Templecombe at 4.12 and arrived at Wimborne at 5.20. After arriving there I asked inspector Perkins what I was to do, and he said I was to be at the station at 10 minutes to seven to work a special. I went to the locomotive shed and did what was requisite to the engine, and went to Wimborne station, which I left with the special at 7.25. Before leaving Wimborne Mr. Gale, the station agent, read a telegram to me, and I read it after him, saying that my train would cross No. 12 down ordinary train at Bailey Gate. The first stopping place was Bailey Gate, and I passed No. 12 down train there. I left Bailey Gate at 7.41. I asked the guard at Bailey Gate where we were to stop next, and he said, "Stop everywhere, and that will make sure." He gave me right away, and I started in the usual manner. I did not ask the station-master at Bailey Gate where else I had to cross. I had never before run with a special train without instructions as to crossing-places. After leaving Bailey Gate I stopped at Spetisbury, arrived 7.48, departed 7.49, receiving right away from the guard and station-master, but no further instructions. I arrived at Blandford at 7.57, and left it at 8.9 in the same way, and so on, until I got to Templecombe at nine o'clock, crossed three trains there, and left at 9.14. Inspector Wood said to me, "You will go steady down the banks." On leaving Templecombe I had engine and tender, 13 carriages, and two vans. I had no order to cross anything at Evercreech. At Shepton Mallet I crossed No. 18 down goods from Bath, but I had no order for doing so. Between Wimborne and Radstock I crossed six trains at four stations, with only one crossing order. I had never worked in that way before. Wherever I have crossed out of the ordinary course I have had crossing orders given to me. I was at Radstock four minutes, the starting signal was down, and the station-master and guard gave me right away. I did not ask where I had to cross anything. I left at 11.12. On approaching Foxcote I saw the arm of the distant-signal in the moonlight partly down, and the light out. That induced me to slacken speed. I saw the home-signal was against me, but not burning brightly; it was just a simmering light, and it was almost impossible to see it until I came close to it. I stopped dead with my engine about 12 yards past the signal-cabin. The signalman was at the window, showing a red light from his hand-lamp towards me. Nothing passed between me and the signalman. I was there six minutes, from 11.15 to 11.21. I looked at my watch both times. I saw the signalman standing at the instrument towards Wellow. He came from the instrument, turned off the red, and gave me a green light to go away, but said nothing. As we started my mate commenced firing, and we were running from six to eight or ten miles an hour, and I was looking over the right side, when I saw a green light of the engine, about 20 yards away, with which I came into collision. I shut off steam, and called out, "O God, Jack." I turned round, and tried to jump, and before I could do so I was thrown on to the ground. I jumped up, thinking to run out of the way, but I was unable to do so. My leg was severely sprained, and I was bruised about the body. I saw no one in the signal-cabin at Foxcote besides the signalman. All the trains which I crossed on the way up to Radstock were ordinary trains. I sometimes, if not very late, find the lamp of the distant-signal, worked from Foxcote towards Radstock, burning; but very often I find the light out when working the 10·30 from Templecombe. About 9 or 10 o'clock it is generally burning, and also the home-signal. The distant-signal in the opposite direction is often not burning when it ought to be. It is oftener in than out, but it is frequently not burning. The home-signal is generally burning, but not always in the winter. I have complained about it to the signalmen, and they often say in excuse that they have no oil. I have not reported it to the locomotive superintendent. I ought to have done so. I did not notice the Foxcote home-signal towards Wellow. If Inspector Wood was travelling with the train, and gave me orders, I should obey them.

John Cadby (sworn).—I have been for 14 months a fireman. I was acting with the last witness on the 7th August. I left Wimborne at 7.25 for Radstock and Bath. All that my mate says is quite correct, as far as I know. The station-master came alongside the engine at Radstock and said, "Where's your mate?" He was under the engine oiling. The station-master said, "Now, then, are you ready to go?" I rejoined, "In one minute, as soon as my mate comes from under the engine." He tried to hurry us away. Nothing else passed at Radstock. There was no light, I am certain, in the distant-signal lamp from Foxcote. The arm was drooping a little from danger. The home-signal lamp was alight and burning as usual. Our engine came to a stand midway between the home-signal and the signal-box, within 50 or 60 yards of the signalman. Nothing passed between me and the signalman. There was not light enough in the box to see if the signalman was using the instrument. I heard my mate say to the guard, "There's six minutes we have been staying here," as he pulled out his watch. The signalman started us by hand-lamp. I went on firing, and as we were going round the curve my mate cried out, "Oh, God, Jack, what's this?" and I was thrown out on my head.

Samuel Evans (sworn).—I have been a goods guard for 13 or 14 months in the service of the Somerset and Dorset Railway Company. On the 7th August I was guard of a special train from Bournemouth, which we left at 6.35, 15 minutes late. Left Wimborne at 7.25, also 15 minutes late. The driver there received a message, not a crossing order, which I saw handed to him, sending us on to Bailey Gate. I was never on a train worked like that before, without a crossing order. I did not think, nor do I think now, that it was necessary to have a crossing order for that train. Some one I thought would arrange the crossings at Glastonbury. We left Bailey Gate at 7.41 after crossing No. 12. We stopped at all stations and crossed trains, but had neither crossing orders nor telegraph messages. I thought it was all right on obtaining right away from the station agent. We reached Radstock at 11.8 and left at 11.12. My watch was about two minutes fast by Bournemouth time. Nothing particular passed between the station-master and myself, except the right away. I thought No. 7 down train would have got to Radstock and returned to Bath by the time we were there. On receiving right away from the station-master we went on. In the collision my van was destroyed and I was thrown out, but not seriously injured; I had two black eyes and a cut on the head. My van was next behind the engine. At Foxcote we were stopped near the cabin. I did not notice the distant-signal; the home-signal was against us and burning. I sung out to the signalman in the cabin, "What is the matter?" but I do not know if he heard me. I looked at my watch, and entered in my book "arrived at Foxcote 11.15 and left at 11.21." I had just completed the latter entry when the book was knocked out of my hand by the collision. I found it next morning in the van. I did not see what the signalman was doing in his cabin, from where I was on the step of the van. I did not notice the signals towards Wellow. I did not go into the cabin until next morning. My watch stopped at 11.23½.

James Vowles (sworn).—I am a breaksman in the service of the Somerset and Dorset Railway Company, and have been so eight months. I was riding in the van at the tail of the Wimborne train. I have nothing to correct in or add to my mate's evidence. At the time of the accident we had 10 carriages, two horse-boxes, and two break-vans. I saw the red light against us at Foxcote, and I did not leave my van.

I saw nothing unusual at Radstock. I had no warning before I felt the shock of the collision and was knocked across my van. I went back to Radstock to give warning of the collision and stop the following train.

Thomas Trowbridge (sworn).—I am a porter at Templecombe station, and have been so about 15 months. I joined the Wimborne train at Templecombe, and was riding in the second-class break compartment in the middle of the train. I did not take the time. I did not get out of my van at Foxcote; nor did I see the signalman. After leaving I heard a whistle, looked out, saw the engine approaching, and was putting on the break when the collision occurred. I had a cut over the eye, and remembered nothing more till next morning.

John Hamlin (sworn).—I am an engine-driver in the service of the Somerset and Dorset Railway Company; 3½ years engineman, 8½ fireman, and 12 months as cleaner. I left Bath at 10.45 p.m. instead of 9.15 p.m. We were waiting at first for carriages to be attached, and afterwards for No. 18 to arrive before we started. We ought to have crossed No. 18 at Wellow. I had orders to wait at Bath from the inspector at Bath station. I reached Midford at 10.58, and left at 11 o'clock; reached Wellow at 11.8, and left at 11.13. I did not ask for a crossing order at Wellow, and think I was justified, considering that I knew nothing of the train that came into collision with me. When I arrived at Wellow the passengers got out, and I moved forward to let the goods train get over the points. I saw the starting signal lowered, and went away as fast as I could. I asked Wills the guard at Wellow how was the time, and saw that we differed two minutes, which I was fast. The guard said to me at Wellow, "Wire in; we have a lot of people to pick up at Midford." My engine was a six-wheeled coupled goods engine, and was not a fast engine. Half a minute after the Burnham train drew over the points I started away from Wellow. I cannot say what happened with the station-master at Wellow. I could scarcely realize at the time of the collision that a train was in my way. The lamp of the Foxcote distant-signal was out as usual, and the arm was nearly down to caution. When somebody else is there the signals seem to work very well. I have not seen the distant-signal lamp alight for eight or nine months. I had shut off steam because of the curve and the gradient, and when I came in sight of the home-signal I saw it was against me, and told my mate to apply the break, saying, "I supposed they could not get line clear." There was only a dim light in the home-signal. I saw the home-signal before I saw the engine of the other train. I had reduced the speed from about 18 miles an hour to about 12 when the collision occurred. My whistle was open when I saw the steam of the opposite engine over the cutting, and in a second I saw the lights. We were then only 25 yards apart. I had got the engine into backward gear when the collision occurred, and I then found myself lying by the side of the engine. I went into the signalman's box and asked how it happened, but cannot say what reply he made. I was then on my way to Radstock to stop other trains. My notion is that the signals were not perfect at Foxcote, because the signalman was not strong enough. It has been so for more than a month. I have never run past the Foxcote signals when I should not have done it. The signals at Wellow might be defective, owing to contraction or expansion of the wires. I have looked at Dando many times and thought he was not strong enough to work the signals.

Henry Pullin (sworn).—I am an assistant guard. I was goods guard for four years, and have been assistant passenger guard two years, but have not been regularly appointed as passenger guard. I receive 24*s.* a week wages from the Somerset and Dorset Company. On the 7th August I was assisting with No. 7 special from Bath for Radstock. I should have left at 9.15 p.m., and left at 10.45 p.m. It had been a very busy day, and we had not sufficient carriage room at 9.15, when the engine was waiting with three carriages, and we wanted 11 more to bring back people from Midford. We waited from 9.15 to 10.30 for those carriages; then we got them, and had to wait for the arrival of the No. 18 up ordinary train. As soon as that train arrived, the Bath foreman started us. We proceeded in due course to Midford, but I did not take the time. As far as I know, the entries in the book of the deceased guard Wills are correct. According to that, we should leave Midford at 11, and arrive at Wellow at 11.8. We had to move at Wellow so as to let the No. 16 goods make way for the Burnham special. I did not see the station-master or the telegraph clerk at Wellow. We had a tank engine and 14 carriages, of which two were break-carriages; I rode in the last vehicle of the train. We stopped about five minutes at Wellow. The rear of the train was beyond the platform which was not long enough for the train. I cannot fix the time when we left Wellow. I believe the station-master started the train, but I did not see him. When the guard Wills started the train, we exchanged signals by white lights from our hand-lamps. Wills has put 11.13 as the time of leaving Wellow. I believe his time is correct. I saw the Burnham special come in out of our way, and we started immediately. I heard the engine-driver whistle as we approached the auxiliary signal from Foxcote, and I felt the train slacken speed. Just after passing the auxiliary signal I put on my break, and had it fully applied. I did not see the home-signal. I saw the lights on the engine coming the other way, but no lights in the signal-lamps at all. I was trying to apply the break tighter, when the collision occurred, and I was knocked down in the van, but not hurt. I went towards the engine. When I noticed the home-signal about an hour afterwards there was no light in it. A few minutes after the collision I went back towards Wellow, and near the auxiliary signal from Foxcote I put down detonators, and returned to the train. The engine-driver, Hamlin, then asked me to go to Radstock and inform them. I saw the station-master. Vowles, the guard, had already informed them of the collision. Mr. Jarrett went with an engine and some carriages to render assistance at once. The arm of the distant-signal from Foxcote was drooping, it might almost be taken for caution, as we passed it before the collision. The signal was not altered by the accident.

Edward Francis (sworn).—I am a relieving signalman in the service of the Somerset and Dorset Railway Company, and have been so two years. I have been at several stations, including some time at Braysdown (Foxcote). The practice of working was the same there as in other boxes. The needle of the block instrument is vertical, except when the pin is in. If I want to give notice to Wellow that a train has passed me, I call them, and if I do not get attention I call again, and for three or four minutes, and if I do not get attention the needle is left vertical, and the proper signal is not given. But this is rare. It has been done at Wellow when I have been working at Foxcote. I have never reported any one for doing so, nor have I been reported. At Midsomer Norton, with the same rules, the arrival of trains is signalled by a bell. That is the only case of the kind on the line. At Evercreech junction from box to box we give in trains by a beat on the bell, because there we can see them. It is double line at the junction from one cabin to another.

John Grant (sworn).—I am regular signalman at Radstock. I was on duty on the 7th August from 6 a.m. to 2.30 p.m. I was in bed a mile away when I heard the whistles blowing, and thought something was the matter. As quickly as I could I went to the spot, and reached Foxcote cabin about half an hour

after the accident occurred. I found the needle blocked over for the train to go from Foxcote to Wellow. The pin was not in the Foxcote instrument. Dando was alone in the cabin. I asked Dando how he came to take on two trains at once. He said he did not do so; that Wellow had sent a train on without "line clear." He told me he had booked no time for it, and I saw he had not done so. He seemed frightened by the accident. Nothing more passed until I went away. I assisted to remove a wounded man. I went back to take off my jacket, and put it in the cabin. A police constable was then in the cabin, but not Mr. Jarrett. Sometimes we have allowed the needle to become vertical, to signal the arrival of a train without going through the form of beats. That practice has arisen from our having to leave the cabin to light the lamps or do other things. The book belonging to the Foxcote cabin appears to be in the same state now as when I saw it soon after the accident.

William Williams (sworn).—I am a signalman at Evercreech junction, in the service of the Somerset and Dorset Company, and have been so for about eight months there, and previously at the Foxcote cabin for four or five months. On the 7th August I came on duty at 3 p.m. and left at 11.55 p.m. I have in my cabin two block-instruments, two telegraph-bells or gongs, and three telegraph-speaking-instruments. I receive crossing-orders and hand them to the station-agent, who hands them to the drivers. There is a telegraph-clerk on duty from 7.15 a.m. to 8.30 p.m. When he is there in my cabin he does the telegraphy, and when he leaves that work devolves upon me. I advise Glastonbury of the departure of all trains, and of the arrival of trains that do not go further. After 8.30 p.m. I advised Glastonbury of all trains that passed me on the 7th August. The up-relief-train passed me at 10 o'clock, and I so advised Glastonbury. I advised Glastonbury of other trains after that. From 10 till 11.30 p.m. I was in the box near the instruments. I did not notice anybody calling Glastonbury, or Glastonbury calling anybody else. I saw no O.A. given, and I did not give O.A. myself. I have never been stopped by O.A. in the middle of a message. If it happened to me I should call the station again if there was no one else at the instrument. If a person were stopped twice by O.A. it would look as if tricks were being played. I have never known, when at Foxcote, the needle being allowed to become vertical without the beats to signal the arrival of trains, and it has not been done at my present station. No trains crossed, except those booked to cross on the 7th August at my station, without crossing-orders.

Edward Rhymes (sworn).—I am telegraph-clerk at Evercreech New station, and have been there about eight months, the time of my service in the Somerset and Dorset Railway. I was 14 at the beginning of this month, and get 6*s*. a week. I had a rise of 1*s*. a week last April. I generally come on duty at 7 a.m., and lately I have not got away before 10 o'clock at night. I am never later than 10, and sometimes I get away at 9. I have my breakfast before I come, and then I have an hour for dinner, and half an hour for tea. On the 7th August I was on duty till 11.30 p.m. I was at a bench a little way off the instruments between 10 and 11 on that night. I only kept a good look-out to see that our station was not called. I saw other stations communicating with one another, but I did not notice what they said. About 11.5 I saw somebody calling Wellow for about three minutes, and just afterwards I saw them speaking; but I did not notice what they said. Before that I did not notice Glastonbury calling anyone, nor anyone calling Glastonbury. I was busy with the monthly goods accounts between 10 and 11 o'clock. I collect tickets, and assist with passengers' luggage when the porters are not on duty. I book all the goods, but not the passengers. I also book all the parcels, and make up the goods accounts. I work the block-instruments when the station-master is away at meals, or off duty at night. I then have charge jointly with the signalman. I did not give O.A. or stop any message on that night, and I did not see O.A. given. Sometimes I have been stopped in the middle of a message and asked my code. I was never stopped when sending information to Glastonbury. I generally find a difficulty in sending a message, because of crossing-orders taking precedence of other messages.

Henry John Collins (sworn).—I am booking-clerk at Shepton Mallet, in the service of the Somerset and Dorset Company, and have been so for one year and eleven months. My duties are to book passengers and parcels and relieve the telegraph-clerk during his meal times. I was on duty on the 7th August from 7.30 a.m. to just after 11 p.m. I was in charge of the instruments from 10 till 11 o'clock. I had no occasion to send any messages during that hour except the T.A. (train advice) for No. 18 down goods to Glastonbury. Between 10 and 11 the following trains passed my station: No. 16 up goods, No. 13 up special, the 7.10 up special from Wimborne, No. 16 up special, and No. 18 down goods. The station-master was in the office with me at the time, but he could not see the instruments from where he was. I gave no train advice for the up-relief-train. I asked Glastonbury about 10 o'clock where the 7.10 special from Wimborne was, and they replied following No. 16 up special and would cross No. 18 down goods at Shepton. I cannot recollect informing Glastonbury when the 7.10 up special from Wimborne passed me. It is not customary to inform Glastonbury of up trains. It is of down trains. The speaking-instrument was at work all the evening of the 7th August, but I noticed nothing at all. I saw no one stop a message and give O.A., nor do I remember touching the instrument myself after making the inquiry about the 7.10 Wimborne train. I knew nothing of the collision till next morning.

Charles Townsend (sworn).—I am station-master at Binegar, on the Somerset and Dorset Railway, and have been so rather more than two years, and in the service for nearly 12 years. My station is a crossing-place. On the 7th August I came on duty at 7.30 a.m. and remained till 11.25 or 11.30 p.m. I can work the telegraph-speaking-instrument. I saw the instrument working between 10 and 11 p.m. on the 7th August, but did not notice anything that passed on it. At that time I did not see Glastonbury calling any other station, or any station calling Glastonbury, but between 11.5 and 11.20 I saw Glastonbury calling Wellow. It went on for about five minutes so far as I saw. I did not see any reply from Wellow. I did not see anything else that passed that evening on the instrument, and am certain I saw no O.A. given, or any message stopped. I did not give O.A. or stop any message myself. I generally work the block-instruments. When I am in the office the booking-clerk, Frederick Church, sometimes works the instruments under my directions, and when I am not there he works them on his own responsibility. I may have called a station to signal arrival and having failed to get attention omit the beats, and simply leave the needle vertical. It is likely that the same thing happens to other stations from us. I have gone in and found the needle vertical without our having given or received the beats. I have not remonstrated with other stations for not giving the beats regularly, and they have not remonstrated with me. Church, my telegraph-clerk, left at 8.15 that evening, the pointsman did not interfere.

William James Read (sworn).—I am station-master at Chilcompton, in the service of the Somerset and Dorset Company, and have been so for three years. It is a crossing-place. I have a pointsman, porter, and telegraph-clerk. I was on duty on the 7th August from 7.30 a.m. to some minutes past 11 o'clock. The telegraph-clerk, Alfred Lance, was there with me the whole time. I can use the speaking-instrument, and

sometimes do. I sometimes telegraph on the block-instrument. I did not notice anything passing on the instruments on the night in question between Glastonbury and others. I heard no one calling Glastonbury, nor anyone giving O.A. I did not give O.A. myself. I received the notice by telegraph from Glastonbury about the running of the up-relief-train, and nothing more in regard to it. I ought to inform Glastonbury of the position of trains, but I did not inform him about the up-relief-train. It was not necessary. If there is necessity to alter a crossing-place I communicate with Glastonbury, if otherwise I do not. That is my rule. There was nothing that could cross the up-train at Chilcompton. In signalling the arrival of trains it has happened to and from my station that the needle has only been allowed to become vertical and no beats given. It may have been through our attention being at other duties. It was rarely done. I cannot say it has been done, and I will not say it has not.

Alfred Lance (sworn).—I am telegraph-clerk at Chilcompton, and have been so for three months. I was 14 years of age on the 25th February last, and I get 5*s*. a week. My hours of duty are various. If I stay late at night I am allowed to come on late next morning. When on early duty I come at 7.30 a.m. and stay till 9.15 p.m. If the last train arrives at 9.15 I come on at 7.30 next morning. If the train did not come between 9.30 and 9.45, then I should be allowed to come on duty at 8.30 next morning. The last train is not generally so late as 9.45. I never leave duty till 9.15. For meals I am allowed half an hour for breakfast, an hour for dinner, and half an hour for tea. I do not find the hours too long. I sometimes book passengers and do accounts. I also collect tickets generally, but the pointsman collects them sometimes. I left duty about 11.8 p.m. on the 7th August. Between 10 and 11 p.m. I was making up my train-book for the day, counting up the number of passengers at the station and the money received from them. That took me half an hour. I also made up some goods accounts, and I did not notice anything going on on the instruments. The station-master does the chief part of the accounts. I did not see any station calling Glastonbury nor Glastonbury calling any other station, nor O.A. given, and I did not give O.A. myself or stop any message. I sometimes work the block-instruments. It occurs once or twice every day when the station-master is busy. I can remember that the needle has been allowed to become vertical without the beats for the arrival of a train. It has been done to us from Midsomer Norton, but not from Binegar on the other side of us.

Henry Jackson (sworn).—I am telegraph-clerk at Midsomer Norton, and have been there for about three months in the service of the Somerset and Dorset Company. Before that I had been 11 months at Stalbridge in the same capacity. My duties are to attend to the telegraphing of the trains, and I book passengers, parcels, and goods. I very seldom collect the tickets. I do not help with the luggage. I work with a bell from Radstock, but not the other way. I found it so when I came and went on doing it. On the 7th August I came on duty at 9.15 a.m. and remained till 11.10 p.m. Between 10 and 11 p.m. I was working at the goods accounts, my ordinary work. I was within a few yards of the telegraph-instruments. I had no occasion to receive or send messages in that hour. I did not advise Glastonbury of the up-relief-train. We had no train it could cross. I did not notice Glastonbury calling any other station, or any station calling Glastonbury. I saw no message stopped by O.A. and did not give O.A. myself. It would not be my duty to inform other stations of the running of the up-relief-train. The train was signalled in the usual way between me and Radstock. The beats on the bell were given for its arrival.

Joseph Morris (sworn).—I am a booking-porter at Midford, in the service of the Somerset and Dorset Company. My duty is to book passengers and attend to the general work of the station. I have been there 12 months. I can use the speaking-telegraph-instrument well. On the 7th and 8th August I was on duty from 7 a.m. on the 7th till about 10 o'clock at night on the 8th August—I should think 10.18. When I left the switch was put on, and there was no one at the station. A telegraph-clerk named Edwin Hues was on duty with me on that occasion, and it was he who was attending to the telegraph instruments between 10 and 11 o'clock on Monday night. On Monday morning only the telegraph-clerk and myself were on duty, and no one else came until the down Bath special arrived some time in the evening. Inspector Ashford and two porters then came to do duty at the station, because we had the Bath Liberal Association at Midford. I was still in charge of the station, and could not get away. There is no station-master at Midford except myself. I am in charge. We have no crossing-orders at Midford, it not being a crossing-place. In the office there are two block-instruments, and one single-needle speaking-instrument. We always signal the arrival of trains by four beats to the right. It has happened that the needle was only allowed to become vertical. I have complained to the station-master at Wellow of that practice, and he replied that he had admonished the person in charge, and it has not occurred since, that was two months ago. Sometimes they were not at the instrument to receive our arrival-signal, and sometimes they only unpinned the needle themselves without giving the beats.

Edwin Hues (sworn).—I am telegraph-clerk at Midford station, in the service of the Somerset and Dorset Company, and have been so for about 12 months. On the 7th August I came on duty at 7. a.m., and remained until about 10.18 on Tuesday night. My ordinary hours are from 7 a.m. to 9.55 p.m. every day, except Sunday. Sometimes I do not get away until 10.30 p.m. My wages are 5*s*. a week and clothes. I was 17 years of age on the 13th of last July. I was in the office between 10 and 11 on the night of the 7th August. I noticed nothing on the instrument at that time. I did not notice any one calling Glastonbury, nor anyone giving O.A. I did not give O.A. myself. I have sometimes complained to the station-master, Mr. Morris, of the long hours. On Wednesdays, Thursdays, and Saturdays I get off at 5.30 p.m., coming on duty as usual at 7 a.m. I have half an hour for breakfast, an hour for dinner, and when I am on late duty half an hour for tea.

Gilbert Slocombe (sworn).—I am ticket-examiner at the Bath ticket-platform, in the service of the Somerset and Dorset Company, and have been so since the line was opened two years ago. I collect the tickets, and advise all passenger and goods to Bath, and all goods-trains to Glastonbury. I also attend to the block-instruments for signalling trains. On the 7th August I was on duty at that place from 11 a.m. till 1 p.m., and again from 5.30 p.m. till about 1.30 on Wednesday morning. Usually I work 12 hours a day from 5.30 a.m. till about 5.45 p.m., or from 11 a.m. till the last train, with a rest between 1 and 5.30. I did not notice anything on the instruments between 10 and 11 on the night in question. I did not notice Radstock calling Glastonbury, nor Glastonbury calling any other stations, nor did I see O.A. given or give it myself, and I did not stop any message at that time. I am often asked by Glastonbury about down-passenger-trains, though my instructions confine me to goods trains. I cannot remember telegraphing the No. 7 down special on the evening of the 7th August. Nobody works the block-instruments but myself when I am on duty. I was 21 on the 8th February last, and my wages are 18*s*. a week.

Henry Quick (sworn).—I am booking-clerk at Bath station, in the service of the Midland Company, and have been so for 17 months. I was on duty on the 7th

August from 7 a.m. till about midnight. I should have left in the ordinary way at 7 p.m., but I remained making up my monthly accounts for the audit. The telegraph-clerks, Hogston and Smith, left a little before 11, and I remained alone in the office. I can work the speaking-instrument. There was a ticket-case between me and the Somerset and Dorset instrument. I might have heard a communication, but I did not. I was busy with my accounts. I am quite sure I did not notice anything that passed on the Somerset and Dorset instrument, or interfere in any way between 10 or 11 o'clock, or about that time. I do not use the block-instrument at all; only the speaking instrument. I did not stop any message between 10 and 11 on the 7th of August.

Reuben Hogston (sworn).—I am a telegraph-clerk in the service of the Midland Company at Bath, and have been so for two years or more. I was on duty on the 7th August from 7 a.m. to about 11 p.m. There were special trains running on that day. Smith, my successor, was on duty during those hours with me, and after then the office was supposed to be closed, but the booking-clerk, Henry Quick, was still there and could have attended to the instruments if required to do so. I keep no book at the office. In regard to the statement that the Bath office was remiss in sending information to Glastonbury, I explain that I had orders not to answer any question from Glastonbury until I had seen either Mr. Radway, the station-master, or the foreman, which would account for the delays. I produce the telegrahp-messages received and forwarded on the 7th August, referring to the running or crossing of trains, eight altogether. I was in the office until from 10.50 to 11 o'clock. I was near the instruments, and saw nothing passing at that time. My colleague and myself left together. I am quite sure that I did not check any message from Radstock to Glastonbury, nor did I observe anything of the kind. We usually closed business at 8 o'clock at Bath. Notice of the starting of the Bath train was sent under the prefix T.A., and is only recorded like all such messages on the train sheets. We sent the notice about 10.43 p.m. When we left the office on August 7th, between 10.50 and 11 o'clock, we left Quick there. I find on referring to the train sheet, that there is no record of the time at which No. 7 down special left Bath, because I omitted to enter it. I am certain I telegraphed it about 10.42 or 10.43. There are four other omissions in the train sheets of four other trains which I believe I telegraphed. I may have been engaged at other circuits. There are three circuits in the office, the Somerset and Dorset, Midland, and Post Office circuits. It was too much for me to attend to myself, and may account for the complaints against Bath. On the night of the 7th of August my successor was with me. The ordinary train, 7.10 p.m. from Bath, is the last train I entered in the train sheet on the 7th August. The train sheet also shows that whereas on the 7th August 21 up trains should have been reported, 16 were not reported that ought to have been reported, and only five were reported. Of the down trains four are not down as being reported, though they may have been reported without my noting them.

Frederick Smith (sworn).—I am now the telegraph-clerk at the Bath station. I was on duty with witness Hogston on the 7th August from 7 o'clock a.m. till nearly 11 at night. I did not send or receive any messages on the Somerset and Dorset instrument between 10 and 11 o'clock, nor did I notice any messages passing on that instrument in those hours. The clerk Quick was in the office between 10 and 11, and I left him there when I went away.

John Furze (sworn).—I have been a police constable in the Somersetshire police five months, stationed at Radstock. I was formerly a pointsman at Staveley on the Midland Railway. I acted in that capacity for six months. I was on the platform at Radstock, about 11.20 p.m., when I heard of the accident from one of the railway officials, whose christian name is George. I do not know his surname. He said there had been a "smash in" down below. I went for the doctor, and afterwards went with him and the station-master, Jarrett, on an engine to the scene of the accident. I lighted a fire on the bank as soon as I arrived, and then went to the distant-signal towards Wellow, at the suggestion of Pullin the guard. The arm was drooped below caution. I saw, after the wreck was cleared away, that the wire was broken. A quantity of the wreck was on the wire when I saw the signal-arm drooping. There was no light in the lamp which was there. I then came back to the home-signal, and the arm was on and the lights out. I did not notice if the lamp was there. I informed Mr. Jarrett how I found the signals. He was close by the engine. I next went into the signal-cabin for the first time, it was about 1.10. It was 1 o'clock when we looked at the signals. I asked the signal-man Dando how it occurred, and he said he was frightened to that extent he did not know. I told him he was to consider himself in my care until released by some officer of the Company. He handed me a paper then. I looked at the block-instruments and saw the needle was pinned over line-blocked, but the pin was not in the instrument. I took particular notice because I knew what it meant, viz., that it was pinned over from Wellow. I thought Dando might have been the cause of the accident and so took him in my care. Mr. Jarrett told me to have an eye on him, and that might have been the reason of my taking charge of Dando. After two hours my sergeant liberated Dando. He was not a lot frightened, and said if I would take him to Kilmerston he would be ready to go. I looked at his book. It appeared to be in the same condition then as now, so far as I know. I read through the statement he gave me and which had his name at the bottom. I can only speak as to the figures in the book applying to the down trains.

Charles White (sworn).—I am a signalman at Foxcote cabin, in the service of the Somerset and Dorset Company. I became a signalman first on the 7th December last year at Shepton Mallet, and at Foxcote since the 1st of June. On the evening of the 7th August I left Bath with the down special at 10.45. I noticed nothing particular till the collision occurred. I was riding in the second coach from the engine. I looked out at Wellow and saw the passengers get out, but I did not see the station-master or telegraph-clerk. We stayed at Wellow four or five minutes. We went along pretty fast after leaving Wellow. I did not see anything of the signal till after the accident. I heard a whistling and was looking out of the window when the collision occurred. I was thrown out; I do not know where I was pitched. The carriage in which I had been riding was smashed to pieces, and the carriage behind had mounted it. In about a quarter of an hour I think I recovered, and went to the cabin. The signalman Dando was there alone. I asked him what he had been about with us, and he said nothing. I said nothing more about it. The instrument was pinned over at Wellow I am sure. I did not look at the book. I left the cabin and went to the cottages to call up the people to give assistance. Then I returned to the cabin, and Dando said that Wellow must have sent on the train without line-clear; nothing more passed. Mr. Jarrett was then in the box, and Mr. Sleep, too, I think. Afterwards I went to the scene of the accident, and rendered assistance there. I can converse a little on the speaking-instrument. I have been learning since the 1st June, but do not find it easy. I do not attempt to use the speaking-instrument. Once or twice since I have been there Wellow has left the needle vertical without giving the beats for arrival. It has happened when I have been absent from the box. It hsa not occurred in the other direction since I have been there. There was no oil in the cabin. Mr.

Jarrett had sent us a little to use three or four days before, until we got our supply. Dando sent the can in. I never lighted the distant or home-signal towards Wellow. The home-signal towards Radstock is lit every night; the distant-signal is lit from Radstock. I cannot see it from my cabin. I noticed the home-signal lamp towards Wellow was burning very dim a quarter of an hour after the accident.

James Ashford (sworn).—I am district-inspector on the Somerset and Dorset Railway from Bath to Templecombe. I have been so for one year and eighr months. On the 7th August I went to Wellow by a special train from Bath at 2 p.m., and returned from Wellow, reaching Bath about 3.15. I then remained at Bath until the departure of No. 7 down special train at 10.42 by my watch, which was right within a minute. I went with guard Wills in the front break-van to Midford, where I left the train, and remained there till 1.20 a.m. At 11.40 I called Wellow to know where the same train was on its return journey in order that I might give information to the passengers who were waiting to proceed to Bath by it. Up to 11.40 I heard of nothing, and did nothing, except keeping the passengers back as the trains were passing. There were 500 or 600 passengers on the platform waiting to return to Bath. Glastonbury, Radstock, Wellow, and Bath were called from 11.40 to 1 a.m. by myself, the station-agent, telegraph-clerk, and porter Adams, and we could get no sort of attention. We did not know then that there was any derangement of the wires, though we found the speaking-instrument working very strong. At one o'clock we got Wellow's attention, and I sent the following message at 1.20 a.m.: "Ashford, Mid-"ford, to Sleep, Wellow. You had better walk on to "Radstock, and let me know full particulars what is "the matter with the up special train." I also left Midford to walk towards the train wherever it was. I thought Sleep would get information of the train and send it me on my arrival at Wellow. I arrived at Wellow at 2 a.m.; and when I went in the office I saw the needle blocked over, and the pin in, on the instrument at Wellow applying to Foxcote. I put my hand on the instrument, and asked Hillard "What's the matter with the up special train?" He told me, "The up special "train has run into the down special train this side "of Foxcote." I asked him what time the up special train was put on from Foxcote. He told me, I am positive, "at 11.10." Hillard was excited, but not particularly so. I told Hillard that he was not to remove the peg until the train had arrived. He then told me there were several passengers killed and injured. I then proceeded to where the accident occurred, leaving Wellow at 2.20. I did not look at the line-clear book before leaving the office. When Hillard told me there were several passengers killed and injured, I informed the porter to go to the "George" Hotel for the horse and trap to take me to Foxcote, and Hillard then said it was gone to Bath Hospital with some people who had been injured in the accident. I noticed the side-lamp of a carriage in the office, and asked Hillard how it came there. He said a passenger had brought it with him from the accident to see his way. I asked Hillard where Mr. Sleep was, and was informed that he had left for Foxcote before my telegram above quoted, sent at 1.20, reached Wellow. I went on towards the accident, and first met guard Wiley, of the Bournemouth train, then standing at Radstock. I next met Sleep, about one mile on the Wellow side of the accident. I asked Sleep about the accident, and he told me it was just this side of Foxcote signal-box, and a fearful smash—a guard killed and several passengers, and several more severely injured. I asked him the cause of the accident. He said, "I don't know." Nothing more passed between us, and he went one way, and I the other. I arrived at the scene of the accident at 2.51, and at the Foxcote cabin 3.17. I found the clock in that cabin one minute and a half behind the Wellow clock. I had noticed when at Wellow that the clock there was, to my belief, showing correct time. I asked signalman Dando the cause of the accident. He told me that "he stopped the up special "train at his cabin for line-clear to Wellow, because "the previous train had not arrived at Wellow, and "that Wellow had sent on the down special train "without putting of her on line or asking clear." I had found in walking towards his cabin that there was no light at the distant-signal or the home-signal. I also noticed that the lamp-case of the home-signal towards Radstock was down at the bottom of the post, and I saw no light from the back speck. I consequently asked Dando why the lamps were out. He told me that the home-signal lamps had been lighted, but they were short of oil, and had no oil for the distant-signal lamps, and not sufficient for the home-signal lamps. The lamp of the up home-signal had been taken down for the oil that was left in it to be used at the accident. He said the down home-signal lamp was alight when the accident occurred, and he did not know the cause of its going out, except that it was short of oil. I did not look at his line-clear book. I found the block-instrument in the cabin applying to Wellow blocked over by Wellow to train-on-line, and the pin was not in the instrument. Nothing more passed between me and Dando. I found John, from Radstock, at the speaking-instrument in the Foxcote cabin. He was working that instrument. Three injured servants of the Company were in the cabin lying down, and police sergeant Membry also came in while I was there. I also saw police constable Furze somewhere near the box when I entered it. I looked at the books for the first time, about 11 o'clock on the morning of the 9th August, when a number of officials were examining them; but did not myself particularly examine them. My duties are to arrange the Bath goods guards, and any other goods guards required; to visit the stations and signal-cabins in my district, or to make inquiries into any matters under the superintendent, and I look after the signalmen to see that they do their duties properly. If I observed anything wrong at stations I should mention it to the station-masters, and if necessary bring it under the notice of the superintendent. It is the object of my visits to find out anything that is wrong, and report upon it to the superintendent of the line, as regards the safe and proper working of the line. I go out for the purpose, at irregular periods, both of day and night. I am pretty well acquainted with the working of the men who have been brought forward here. I consider Dando a competent person for the post of signalman at the Foxcote cabin. I am positive he was capable of pulling the levers. He did not understand the speaking-instrument, and I had told him to learn it at intervals. It is not necessary that the signalman at the Foxcote cabin should know how to use the speaking-instrument, so far as regards his duties at that cabin, because he is protected by Radstock on the one side, and Wellow on the other, as follows:—if the signalman at Foxcote were to make a mistake in his block-working, he still ought to be protected, and there ought to be no danger of collision, in reference to his duties, because if it became necessary the alteration of the crossing-place would be arranged either at Radstock or at Wellow. I mean that if a down train was due to cross an up train at Radstock, and if Radstock should ask clear for the up train and block to Foxcote; and if Wellow should then ask clear to Foxcote for the down train, and block the train to Foxcote, that would not justify Wellow and Radstock to send those trains forward until they had received crossing-orders from Glastonbury "keep down train" at Wellow for up train to go on from Radstock to cross at Wellow; although we know that a signalman at Foxcote would be doing wrong to give line-clear for an up and down train at the same time. I think Dando would be a fit man to put at a crossing-place. Before he was put in charge at Foxcote he had instructions not to have two trains at the same time on the section between Radstock and Wellow. I told

him so. Mr. Wood sent Dando to the Foxcote cabin. I do not know on what day. I examined him on the 19th June in respect of the levers in the locking-frame and the block-telegraph instruments, and asked him what he would do in the case of points being wrong or dangerous to a coming train. He said he would give six beats to block line. He told me he was competent to take charge of the duties of that box. He had been working for some time previously with relief-signalman Francis. I am well acquainted with Hillard, and I heard him say here that he was 15 years of age, and received 7*s.* 6*d.* a week, and is employed about 13½ hours a day. I think him fit to be in charge of the safety of the single line. The signalmen had nothing to do with the working of the single line between 6.30 and 11 p.m. on the night of the accident; but I think Hillard was quite competent for the post. I think he would be a proper person to take charge of the single line at any station, so far as his knowledge of the telegraph is concerned. It is my duty to note the condition of signals as I pass them. On one occasion I observed that the down distant-signal from Foxcote was not lighted when it should be. That was on the 4th or 5th April. I reported the case, and was told that the lamp had been lighted and had gone out. Since that date I have not seen the lamp out when it should be lighted. I have seen it lighted since. I cannot say that it was lighted in May, or in June, or in July. I reported the case in April to the superintendent of the line. I am not certain as to whether that lamp has been lighted since, as it had been previously. I think there have not been trains sufficiently late to require it. The last train was 7.45 p.m. at that time. A train leaving Bath at 7.50 p.m. would get to Foxcote at 8.30 p.m. It might get there a little later. If a special late train had been running it would be the duty of the signalman to light his lamps for it. It is the practice of railway companies not to light their lamps when trains are not expected. I might pass the Foxcote signals every evening. I gave written instructions to the signalmen as to lighting their signals on the 22nd October 1875.

The following is a copy :—

"To be posted up in signal-box at Foxcote.

Signalman Grant, Bath, 22nd October 1875.

You will be required to come on duty in time for the first train in the morning, and remain on duty until 4.0 p.m., changing alternate week with signalman Williams, and light the down distant-signal lamp before leaving duty, when you are relieved by signalman Williams.

Signalman Williams,

You will be required to come on duty at 4.0 p.m., and remain on duty until all trains have passed, changing alternate week with signalman Grant until further orders.

Yours truly,
J. Ashford.

Acknowledge receipt of this notice."

I have seen the paper on the notice board in the Foxcote cabin, but I am not sure that Dando has seen it. It was not there on the 9th August. I have never given any instructions to Dando as to whether the down distant-signal should be lighted. The instructions referred only to winter arrangements. Dando had never complained to me of want of oil till the night of the accident. Mr. Jarrett is responsible for supplying him with oil. If the signalman had applied for oil, and Mr. Jarrett had not given it the latter would be to blame. It is not part of my duty to see there is a sufficient supply of oil in the signal-cabins. The injured men who were in the cabin were, I think, not aware of what passed between me and Dando. They were drowsing. I noticed the two cards of instructions hanging in the Foxcote cabin. The arm of the down distant-signal was drooping, but I did not mention it to Dando, because I saw wreck on the wire, and when I went into the box I saw the lever was in its proper position.

Mr. Frederick Usher Wood (sworn).—I am chief inspector of the Somerset and Dorset Railway. On the 7th August I arrived at Glastonbury, my head-quarters, at 7.55 a.m. and went at 8.11 with the ordinary train to Templecombe, and returned again to Glastonbury at 10.45. I remained there attending to traffic until 12.53 when I left for Bath. I arrived at Bath at 3 o'clock and left by the 4.15 down train, and arrived at Templecombe at 6.50, where I remained attending to traffic till 9.20, and travelled by the up-relief-train in question to Evercreech junction, where I left it at 10 o'clock. I left Evercreech by the ordinary train at about 10.6 or 10.7 and reached Glastonbury at 10.35. I was looking after the special traffic. At 10.35 I went into my office and opened the trap-door which cannot be opened from the crossing-agent's office, and seeing Mr. Percy busy writing orders. I shut the trap again saying, "Oh, go on." I then opened some letters waiting for me and went out of my office and round to Percy's office door, which I found unlocked, and I walked straight in, it was then 10.42 within a minute. Mr. Percy was sitting at his table not writing, and Locke, the clerk, was working one of the instruments, I cannot say which, I think it was the one next to the Bath instrument. I said, "Where is the down special from Bath?" He replied, "Not left." I said, "Well as she has not left cancel her running, "because there is plenty of room in the up special "to take on the Midford passengers." His reply was, "Very well, I'll do so." I think he said something about other crossing-orders, and after seeing him taking up some telegraph-pads I left the office, nothing else having passed. I thought the up-relief-train would reach Midford under the circumstances of gradient, and my caution as to the banks, there being a special in front of it at 11.30. It would run from Radstock to Midford in from 15 to 17 minutes. The train ran a little faster than I expected, as I did not think she would get to Radstock at 11 o'clock. I then went to my house, five or six minutes walk from the station, where I arrived at 10.55. After going to bed I was called up about 12.15, and on looking out saw Mr. Pattison (Mr. Difford's chief clerk) and Mr. Percy who beckoned me down and I went as soon as possible. They told me of the collision and said it was very serious. I went to the station and asked a clerk to get information from Foxcote, and it was replied that the guard was killed and a driver then in the cabin injured. After collecting men and material I went to the scene of the accident and reached there about 7 a.m. I walked from Radstock to Foxcote and met Mr. Difford there. I went into the cabin and saw Dando. He was not much confused. His book was then in the same state as produced. He said nothing different as to the cause of the accident than he has stated at the inquiry. He has never varied in his story. I assisted at the spot, and went with Mr. Difford to Wellow from 2 to 3 o'clock in the afternoon. The line-clear book was examined and appeared to be in the same state as now, the blot being there, but I did not notice the erasure. We examined the station-master, signalman, and clerk, and they gave a contradictory statement to that of Foxcote. I think they said the same then as now. Mr. Percy had informed me at Glastonbury that he asked Wellow where the down special was, and he said he had the reply "down over T. and up on from T." but it was only after he had heard from Radstock that the up train had left there that he feared there would be an accident unless the trains were brought to a stand by the Foxcote signals. I knew Dando before he was appointed to the Foxcote signal-cabin. He had been working in a colliery as a miner, and made an application about two months before he got his appointment for the post of signalman at Foxcote. He was made a porter at Radstock station on the 22nd May by the superintendent. He said he would prefer being in the signal-box and I told him he might employ himself when not otherwise occupied in learning the duties. On the 6th or 7th June I was at Radstock and asked of Mr. Jarrett how Dando was get-

ting on, and he spoke very well of him, and that he was very attentive. I said he applied for the Foxcote box, what do you think of him? He replied, "He will do very well." About two days afterwards I saw relieving-signalman Francis at Radstock, I asked him what he thought of Dando, and whether he thought he would do for the Foxcote signal-box. He said he thought he would do very well. Then I sent him there and afterwards on my recommendation the superintendent sanctioned Dando's appointment. I visited Dando on the 17th June, he had gone there on the 11th or 13th, and he appeared to be conversant with his duties. I requested the district-inspector to examine him and when he certified to me in writing (copy produced) dated the 19th June 1876, that Dando, who had hitherto been working with another man, was competent for the duties, I placed Dando in charge on the following day. So far as I know he has performed his duties to my satisfaction. Inspector Ashford has told me that he had informed the signalman Gillard he was to be jointly responsible with the boy Hillard, for the conduct of the working in the absence of the station-master at Wellow. At the time, six months ago, when Sleep was relieved at 6.30 in the evening, it was arranged that the clerk and signalman jointly should take charge. It was not put in writing. I visited there, and taking the time-book in my hand, I said there are only two goods-trains to be crossed, and a passenger-train to be passed into Bath, and there is no need for the station-master to stay later than 6.30. p.m. If the superintendent had known that the station-master left as he did on the day of the accident he would have severely reprimanded him, even if there had been no accident. It surprised me very much to hear he had been absent, and he was not justified in doing so. I did mention to him that it would have been better if he had stayed away altogether. It was a breach of the Company's rules for the station-master to allow Hillard to act as he did in ordinary working. I think it was an exceptional case. It is understood that the signalman takes charge of the station in the absence of the station-master. There is no doubt Hillard had assumed too much. I was not aware that there was a peculiar method of signalling arrivals between Midsomer Norton and Radstock. The bell was put there to assist in drawing attention for the level-crossing, but not to serve the purpose it has been used for. At busy times I have heard that ordinary messages were delayed by Glastonbury's crossing-orders. It would be better to have a double wire on that circuit. I have had cases of clerks partly receiving messages not intended for them, and then shaking up the instrument. I have failed to detect the guilty clerk. There was no one on duty at Masbury who could have given O.A. to Radstock as represented. I heard of the up-relief-train for the first time at Templecombe at 7.55. I think the driver of the up-relief-train should have had a crossing-order at Radstock for Wellow. It was the duty of the station-agent at Radstock to give it to the engine-driver, and not the driver's place to ask for it. I think if Radstock had been stopped 20 times he ought not to have let the up-relief-train go without a crossing-order from Glastonbury, knowing that he had a down train overdue. Mr. Percy appears to have relied on Radstock to inform him of the position of the up-relief-train, and that the Radstock station-master would never have allowed it to go without communicating with Glastonbury. Mr. Percy, after saying he would arrange the crossings of the up train, should have made inquiries no doubt, and I should myself have asked Radstock and other stations about it, being an extraordinary case. I have no recollection of a message like that of Mr. Percy's, "I will arrange its crossings." The words were unnecessary; it must have been either Mr. Percy or his assistant who should arrange crossing-places. Inquiring about trains is voluntary on the part of the Glastonbury crossing-agent; it is not his duty under any circumstances under the rules. It was the Wellow station-master's duty also to obtain a crossing-order before despatching the down Bath train, because although he might not have known of the up-relief-train, he ought to have known that another up train—the Bournemouth excursion—was overdue at Wellow. It would be taken for granted that Sleep would remain on duty on an occasion like the 7th August, but he was not specially instructed of it. (Mr. Ashford remembers a case where Sleep was on duty after 6.30 p.m. to attend to a special train, since the arrangement of six months ago.) Sleep being off duty it was the duty of Hillard to obtain a crossing-order from Glastonbury, and afterwards to act jointly with the signalman as to carrying out the instructions. Mr. Percy seemed alive to his duties that night at Glastonbury, and Locke also, but I did not speak to the latter. My room is only used by the station-master and myself. There was no one but the boy in Percy's office and himself when I went in. The practice of treating vertical needle as signal of arrival has never been reported to me; nor have I detected it. On the first occasion I should severely reprimand whoever did so; if repeated, I should report him to the superintendent. If he has several other duties to perform it affords some excuse to anyone doing so. I don't think that practice has had anything to do with this accident. I should say Wellow would always give the four beats, having a train just arrived and wanting to ask "line-clear" for another.

Mr. Edward Peacock (sworn).—The statement I produce and which has been read to me is correct. It is as follows:—

On the evening of the accident my intention was to leave Bournemouth by the ordinary 6 p.m. train; it was very full, and I was informed another train would be made up and start directly, as the ordinary train, stopping at all stations the same. I took a seat in a second-class carriage, at the rear end of the train, wherein were 10 others who all got out at Evercreech junction. Our train started about half-past six or twenty minutes to seven. I did not particularly notice the time at starting; but on nearing Evercreech junction, from remarks made by other passengers, it was near upon 10 o'clock by my watch, just previous to which the moon began to rise very brightly. There were no lights in the carriage. Stayed some little time at Evercreech, where a train was waiting, I think to take passengers on to Wells, &c. A great many passengers got out; all in fact that were in the same compartment as myself, I being the only one left; no one else got in after. Whilst waiting at Radstock I particularly noticed the time, it was 10 minutes after 11 o'clock, and as the porters and guards were going the whole length of the train, calling out were there any passengers for Wellow or Midford, I concluded the train would run through to Bath, and, consequently, I should be home in good time. I threw myself at full length on to the seat. We had not started but a little time when I heard the break-whistle of our engine, and our train came to a standstill, but very gradually. After laying a minute or two, I found we did not go on. I got up and looked out of the window. The window was about half up, so that I could stand upright. As I was looking, with my arms resting on the window, I saw what I thought at the time was the end carriage of another train in front. I could hear voices as though the drivers or guards were calling or speaking to the guards in the other train. Just then the red light reversed to a green; our train immediately moved on. I then saw what I thought to be the end of another train was a signal-box; the man inside just then crossed from one side to the other; he had on only his trousers and shirt. I noticed that the light I saw reversed was from a hand-lamp that was then placed on the shelf or board facing Radstock. As I came opposite the signal-box I again threw myself at full length, with my arms under my head, along the seat towards the engine. I had no sooner done so than there was a tremendous crash. I was thrown to the opposite side of the carriage, and back on to the floor between the seats in an instant of time. I thought we had run into another train. "Was" the "sides" or "roof" of the carriage coming in? Finding I had the use of my limbs I immediately jumped up,

and out of the carriage into a potato field; but on getting out I could see (it was just upon a curve) it was another train into which we had run. The first person I saw was the guard Evans; he was standing apparently dazed, with the blood running down his face. I spoke to him. Just then another guard, a young fellow, got or stumbled out of the débris; he was bleeding from his face. I spoke to him. He did not seem to be quite conscious. Just then I heard some voice, and saw the poor fellow Godfrey jammed between the buffers and the end of a carriage, with a whole mass of wreck on the top of him. I asked him if he was conscious; he said yes. I asked his name; he told me Wm. Godfrey, of Radstock. At that time another guard came round from some part of the train; he did not seem hurt, and I asked him or told him to pull himself together, as this was a bad affair (pointing to the poor fellow Godfrey,) and just then saw one of the drivers or stokers, who was trying to pull himself up to the handle of the break. He seemed very much hurt; but I could render him no assistance, as there was a quantity of the wreckage between us. I asked him, the guard, if I could go backward or forwards to prevent anything else running into the wreck? He just then seemed to recover himself, and said, "Oh, yes, come along here." He then went a few paces towards Radstock, and then turned back to the end of the Bath train, and took down the side-lamp from the end of the train, and told me to go towards Wellow, but to be sure and keep the red light in front, and he would put down some detonating-signals. I immediately ran on towards Wellow, calling out as I went along, but previously whilst or immediately upon speaking to the poor fellow Godfrey I looked at my watch to see the time, as I thought it would be useful, it was then just 20 minutes past 11; I scribbled it on a letter at the time as there should be no mistake. There was no signal-light between the meeting of the trains on the line and Wellow, as not being acquainted with the neighbourhood I was particularly on the look-out for any signal. About 300 yards from Wellow I met some one coming towards me a shouting what was the matter. I told him; he told me he was the station-master at Wellow, and that it was the above distance. He asked me to go back with him. I asked him how far it was, he said about two miles or more, and that it was about 300 yards to Wellow station. I asked him if there was no one at the station who could telegraph; he said yes, but that the communication was stopped from Radstock. He said that he was afraid something had happened from the continued whistling of the engine (which could then be heard); he hurried on towards Radstock, and I towards Wellow station, just this, Radstock, side of which I met other persons and the telegraph-boy, who I told to come back and see if he could not get through to Bath with information; he said it was no use to try, as they closed at 8 o'clock. I went with him to the office, and begged him to try and call Bath or somewhere else where he could get through to; he worked at the instrument for several minutes, but without effect. I then knocked up the landlord of a public-house and hired his horse and conveyance, and drove with all speed to the Midland Railway at Bath, and told the manager what had occurred, it was then exactly half-past one o'clock. I asked him if I could be of any assistance if I went back with him. He thanked me, and said I could not, he would do his utmost. I then hastened home for reasons before stated. I was under the impression that everyone who may have been in the carriages must have been dead, but I did not think there could be many people in the train. I thought all the carriages in the Bath train were empty, as the guard that gave me the lamp said it was a lot of coaches to take the people home from Midford. Up to the time I left the scene of the accident, with the exception of those already mentioned, there was no other person about, and not a sound to be heard with the exception of the whistle from the engine.

The telegraph-boy at Wellow, Hillard, did not seem to know of the up-relief-train which came into collision. It was somewhat difficult for me to make him know what train it was. If there had been a light between the point of collision and the Foxcote cabin I must have seen it, but I did not see any such light.

Observations.

In order that the above evidence, and the bearing and importance of different portions of it, may be better understood, it is necessary first to reduce it to the form of a condensed narrative. It will then be more easy to sum up the defects and causes which have contributed to produce this most serious collision.

It will be observed, in the first place, that the traffic on the single-line of the Somerset-and-Dorset Railway is worked by telegraph, and that, under the printed regulations in force, the safety of the public, as against the danger of engines or trains meeting each other whilst travelling in opposite directions on the single-line, is provided for (1) by the employment of a crossing-agent at Glastonbury, who is specially charged with the duty of arranging for the crossing of trains running out of course, or not according to the printed time-tables; and (2) by the use of block-telegraph-instruments in the hands of the station-agents, whose duty it is to take care that no two or more trains are allowed to be between two block-stations at the same time. But the Company's regulations for single-line working do not contemplate or provide for, as regards most of their provisions, either the case of a train running without a previously arranged time-table, or the interposition of a signal-cabin without a crossing-loop, such as the Foxcote signal-cabin, between the Radstock and Wellow crossing-stations.

In proceeding next to consider the circumstances more immediately connected with the present collision, it would appear, that for Monday, the 7th August, which was a bank-holiday, arrangements had been made and time-tables issued for the running of special trains to and from different stations; and further, that the superintendent-of-the-line, on finding that the 8.11 a.m. train, by which he travelled on that day from Glastonbury to Poole, was heavier than was desirable, determined to divide it on its return journey into two portions. After having ascertained that he could obtain an engine and carriages for the proposed relief-train, he despatched at 4.19 p.m. a telegram from Templecombe to the crossing-agent at Glastonbury as follows:—"I "have sent one of the engines of 12.50 up goods back to Wimborne, running to time

" of 1.50 down. It will work from Wimborne to Bath as 6.10 ordinary, which train " will follow special with excursion passengers."

The crossing-agent, thus instructed, first advised all stations from Templecombe to Wimborne, commencing at 4.23 p.m., that a special engine had left Templecombe for Wimborne at 4.10 p.m., crossing No. 14 up-train at Blandford; next telegraphed to the Wimborne station-master at 5.48 p.m. to advise him as to when this up-relief-train would be ready to leave Wimborne; and, on learning that it would be ready to leave that station at 7.10 p.m., advised Wimborne, Bailey-Gate, and Blandford that a special train would leave Wimborne at 7.10, crossing No. 12 down ordinary train at Bailey Gate, and telegraphed at 7.18 p.m. to all stations (but not to Foxcote), "A special " train will leave Wimborne at 7.10 for Bath. I will arrange its crossings." He also sent a message to Templecombe at 9.7 p.m., "Keep up-special-train at Templecombe to cross No. 17 down-ordinary-train. Repeat." But he did not arrange for a crossing at Shepton-Mallet with No. 18 down-train, because it was not due to leave that station until after the arrival of a Weymouth train running behind the up-relief-train.

This up-relief-train, then, as it may best be called, to distinguish it from other trains, left Wimborne at 7.25, and was reported by telegraph to the crossing-agent as having done so. He did not arrange for its crossing the down-Bath-special with which it came into collision, because that train was due to reach Radstock and to leave Radstock again for Bath before the up-relief-train could arrive at Radstock. It was also reported to him as having left Evercreech junction at 10 o'clock. The crossing-agent heard nothing further about it until after the collision occurred; but it reached Wellow at 10.58, according to the book of the signalman Horsey, who noticed on the following day that his clock was five minutes slow; or at 11.8, according to the engine-driver, and also by the watch of guard Evans, which was, he believes, two minutes fast,—consisting of an engine and tender, 10 carriages, two horse-boxes, and two break-vans.

When the up-relief-train thus reached Radstock, there was overdue in the opposite direction a down-special-train (No. 7) from Bath, to the progress of which it will next be necessary to refer. This train, due to leave Bath at 9.15 p.m., for the purpose of running to Radstock, and picking up on its return journey some 500 or 600 passengers at Midford, was delayed in starting from Bath, first, because there were eleven carriages wanting for it, and, secondly, because an up-train (No. 18, ordinary), which was to cross it at Bath, had not arrived. It finally left Bath at 10.45 p.m., an hour and a half late, and reached Wellow at 11.8, consisting of a tank-engine and 14 carriages, of which two were break-carriages.

The position of affairs, therefore, shortly before the collision, was as follows:—

Of the two trains which came into collision with one another, the up-relief-train reached Radstock at 10.58 according to the book of the Radstock signalman, or 11.8 according to the engine-driver and guard, and the down-Bath-special-train reached Wellow according to the engine-driver Hamlin, and the guard Pullin, at 11.8, and about the same time by the Wellow record-book. The station-master, Jarrett, and his telegraph-clerk, John, were on duty at Radstock. The Wellow station-master, Sleep, returned to his station by the down-Bath-train, at, as he says, 11.8 or 9, and resumed his duties there with his telegraph-clerk, Hillard. Between them, at one mile from Radstock, and rather less than three miles from Wellow, was the Foxcote signal-cabin, at which Dando, the signalman, was alone on duty. The crossing-agent at Glastonbury had not heard of the trains since the up-relief-train left Evercreech junction at 10 o'clock, and the down-Bath-train left the Bath ticket-platform at 10.48. He had not received nor obtained advice from either Wellow or Radstock, and the station-masters at those places were without instructions.

The down-Bath-train being overdue at Radstock, the up-relief-train could not properly, according to the spirit, though not the letter, of the regulations, leave Radstock (1) without instructions from the crossing-agent, and (2) without its being taken on block from Foxcote. The Wellow station-master had no means of knowing anything of the running of the up-relief-train; but another train, following it from Weymouth, was overdue at the Wellow station, and the down-Bath-train could not properly leave Wellow (1) without instructions from the crossing-agent, and (2) without being taken on block from Foxcote. The signalman, Dando, at Foxcote, could not properly, in the working of his telegraph-instruments, afford permission for the up-relief-train from Radstock, and the down-Bath-train from Wellow, to approach his cabin at the same time; nor could he properly, when the up-relief-train reached him from Radstock, allow it to proceed towards Wellow until he had received notice of the arrival of a preceding Burnham-special-train at Wellow.

The mistake of telegraph-working which, in the absence of proper crossing arrangements, was the immediate cause of the collision, lies between the station-master,

Sleep, and the telegraph-clerk, Hillard, at Wellow, on the one hand, and Dando, the Foxcote signalman, on the other hand.

The case of Wellow is briefly to the effect that permission was received in due course on the block-instrument to send on the down-Bath-train to Foxcote; that it left Wellow at 11.10; and that its arrival at Foxcote was announced, not in a proper way, but by the needle being found vertical at 11.16, and 11.15 was therefore entered in the record-book as the time at which that train reached Foxcote. It is then admitted that at 11.18 Foxcote obtained permission in a proper manner to send on the up-special-train to Wellow; and, indeed, the block-instruments at the two places remained pegged over from Wellow, in proof of such permission having been granted, for many hours after the collision.

The case of Foxcote is, that the up-special-train was detained at that cabin, on its way towards Wellow, because the arrival of the preceding Burnham-special-train had not been announced; that after the arrival of the Burnham-special-train was reported from Wellow, it was two or three minutes before the attention of Wellow could again be obtained; that permission was then received in due course for the up-special-train to proceed to Wellow; that it was started at a time entered subsequently to the collision as 11.6 (which was admittedly unreliable, and was proved by other evidence to be incorrect); that shortly afterwards came the crash of the collision; and that no notice whatever had been given in regard to the down-Bath-train.

It being thus admitted that the proper signals were exchanged on the instruments in regard to the up-special-train, the point to be determined on this part of the subject is whether any signals were exchanged between Wellow and Foxcote, as alleged at Wellow but denied at Foxcote, in regard to the down-Bath-train.

First, as regards Wellow:

Sleep, the station-master, reached Wellow by that train. He states that he saw the needle of the instrument blocked over, as if for that train to proceed to Foxcote, before he instructed the guard to start it. He afterwards saw the needle blocked over as if for a train from Foxcote. He is not sure whether he saw the needle vertical, which Hillard alleges, between the blocking over for a train to and that for a train from Foxcote; but he communicated with Glastonbury that one train had gone from him and the other was approaching him, by first telegraphing "down over T," and adding immediately "up on from T"—because he had seen the needle vertical, and had also seen the needle blocked over for a train from Foxcote. He then made the remark, "I should think that train had not time to leave Radstock." About 11.20 or 11.21 he noticed the speaking-instrument working strongly, from the entanglement of the wires.

Hillard, the telegraph-clerk, states that Sleep brought the up-Burnham-special-train into the station, and told him to announce its arrival to Foxcote, and ask for line-clear for the down-Bath-train. The needle was blocked over for the up-train. He took out the pin, and exchanged, first the beats necessary for announcing its arrival, and then the beats for the down-train to start; and, the needle having been pinned over from Foxcote, he put down in the record-book 11.10 as the time of the departure of that train. He was going out to tell Sleep; he met him in the doorway; he told him all was right, and Sleep started the train. He went out to collect the tickets of the passengers by the down-Bath-special, which took three or four minutes; he came back to the office, and cancelled the tickets with a punch; and, looking round, he saw the needle of the Foxcote block-instrument in an upright position, at 11.16 by the clock. He booked, therefore, the arrival of the down-Bath-train at Foxcote at 11.15. About a minute or so later he observed Glastonbury asking "Where is No. 7 down-special?" He replied, "Down over T." Immediately afterwards he exchanged signals with Foxcote for the departure from Foxcote of the up-relief-train, pinned his needle over to train-on-line, entered 11.18 in his book, and then telegraphed to Glastonbury "Up-special left T." Sleep said, "Surely that train cannot have got to Radstock and the up one left in that time!"

The evidence of Sleep and Hillard, condensed as above, for this particular subject, is circumstantially given, but it presents many points of difficulty. If the down-Bath-train had left Wellow, as they state, at 11.10 or 11.11, it would have been far beyond Foxcote before the time when the collision occurred, about 11.21, 247 yards on the Wellow side of Foxcote, and within less than three miles of Wellow. The Wellow clock was as nearly right as possible, according to the district-inspector, who compared it with his watch after the accident. If the other evidence is to be believed,—and it appears to me to be reliable,—the down-Bath-special could not have started at 11.10 or 11.11, because the up-Burnham-train was not admitted to the station till 11.14, according to the watch of the guard, which had been set at Bath that morning, and was four minutes fast three days afterwards. The guard, Upward, of No. 16 up-

goods-train above referred to, and his breaksman, Cooper, who was waiting to follow the up-Burnham-train to Midford, on finding, at 11.19 or 11.20, that the up-relief-train was on block from Foxcote, said, "If the Bath special had got to Radstock she must be very quick, for the Burnham special had not got to Midford." Having seen the two trains start, he knew that the Burnham train ought to have reached Midford before the Bath train could get to Radstock. According to the book of the deceased guard (who was killed in the collision) of the down-Bath-train, and the evidence of the engine-driver, that train left Wellow at 11.13, and it appears to have travelled towards Foxcote as fast as a six-wheel-coupled goods engine could well take it. These discrepancies as to time are rendered still more serious by the condition of the Wellow record-book. There has been an erasure, and there is a blot of ink over it at the figures 11.15, purporting to represent the arrival at Foxcote, as reported to Wellow by the vertical needle, of the down-Bath-train, which never reached Foxcote; and the figures 11.18, entered as the time when the up-relief-train was taken on block from Foxcote, have apparently been altered from 11.10, the time named three hours after the accident by Hillard to Inspector Ashford as that at which he had received it on block from Foxcote. There is, further, a contradiction between Wellow and Glastonbury as to the message, "Down over T., up on from T.," which the crossing-agent states that he took from the instrument as one message without any break in it, about 11.12 or 11.13. Hillard states that he sent the message in two parts, and that he exchanged signals with Foxcote for the up-special-train between sending "Down over T.," and "Up-special left T.," which is his version of the latter part of it.

These difficulties and discrepancies would, of themselves, render it impossible entirely to rely on the evidence of the station-master and telegraph-clerk at Wellow. The evidence, directly opposed to it, of Dando, the Foxcote signalman, which must next be considered, is of a simpler character.

Dando says he first received notice of the up-special-train at 11.2, and he brought it to a stand close to his cabin at a time marked as 11.5. He waited for about four minutes, till the up-Burnham-special-train, which preceded it, had been cleared from Wellow at 11.4. He then tried for about two minutes to obtain, and at length attracted, the attention of Wellow, and received permission to send on the up-special-train to Wellow. He had no notice whatever, and exchanged no signals, in regard to the down-Bath-train. He entered 11.5, 11.6, 11.6, in his record-book after the collision, as the times of arrival and departure of the up-special-train; and noted 11.6½ as the time of the collision, and made a memorandum of the occurrence, all at the suggestion, but not at the dictation, of John, the telegraph clerk from Radstock, who visited his cabin, and was engaged in telegraphing thence to Glastonbury, after the collision. He wrote "special 7" in his record-book, in readiness for entries of the times of the down-Bath-train; but they were never filled up.

This evidence of Dando is wrong and contradictory as to the times given for different occurrences. It would appear from the statements of the engine-driver and guard of the up-special-train, that it reached Foxcote at 11.15 p.m., instead of 11.5 p.m. as entered by Horsey, the Radstock signalman, and by Dando, in their record-books; and that it was detained for six minutes at Foxcote; and the collision occurred soon after 11.21, as it left Foxcote. The book of the guard, Evans, was knocked out of his hand by the shock of the collision, just as he had completed the entry "11.21" for the time of the train leaving Foxcote. But Dando has never wavered on one point. His statements shortly after the accident, his written memorandum, and his subsequent evidence, all agree in the positive assertion that he had received no notice of and had no reason to expect, the down-Bath-train, when he allowed the up-special-train to leave Foxcote for Wellow.

Having regard to the evidence and actions of all the parties concerned, and to all the circumstances of the case, there can be no reasonable doubt, in coming to a conclusion, and deciding between the distinctly contrary statements from Wellow and Foxcote, that the station-master and telegraph-clerk at Wellow, in sending off the down-Bath-train to Foxcote, omitted to exchange any signals with Foxcote in reference to it; that the blame in this respect rests entirely with them; and that the Foxcote signalman, not having had any notice of that train, and having received permission to forward the up-special-train to Wellow, was justified in starting it, as he did, just before the collision occurred. But whatever conclusions may be arrived at on these points, a distinct and most serious responsibility clearly rests on Sleep, the station-master at Wellow, for having (at 11.18 according to his record-book) given permission on the block-instrument for the up-relief-train to leave Foxcote, without allowing sufficient time for the down-Bath-train to reach Radstock. As there was no crossing-place at Foxcote, it was necessary that the down-Bath-train should get to Radstock before any up-train could leave Radstock; whereas the down-Bath-train had not time even to reach Foxcote before the collision.

The next important point to be discussed is why the crossing-system also failed.

The two trains which came into collision reached, the one Wellow, the other Radstock, about the same time, say, 11.8; and they started, the one from Wellow about 11.14, and the other from Radstock also about 11.14, both towards Foxcote, where there was no crossing-loop. It was, looking to their times of running, the duty of the crossing-agent to arrange for their crossing at either Wellow or Radstock; it was the duty of the various station-masters to advise Glastonbury freely of their running; and it was the duty of the station-masters not to send forward a train to cross another train out of turn, without first receiving, and handing to the engine-drivers, proper crossing-orders or telegraph-passes. These duties were in the case of these two trains, as regards the two stations, Wellow and Radstock, wholly neglected. Mr. Percy, the crossing-agent, admits that no arrangement was made for the crossing of the up-special-train from Wimborne by the down-special-train from Bath, with which it came into collision, "because the train from Bath was due to reach Radstock, "and to leave Radstock on its return to Bath, before the up-special-train was likely to "reach Evercreech junction." He first heard of the late departure of the down-Bath-train on asking about it at 9.50. He afterwards ascertained that it had left Bath at at 10.23, which turned out to be a mistake for 10.43, and that it had passed the Bath ticket-platform at 10.48. He had previously been informed, first that the up-special-train would be ready to leave Wimborne at 7.10, and afterwards that it had left Wimborne at 7.25. At 7.40 he telegraphed to all stations, "A special train will leave Wimborne at 7.10 for Bath. I will arrange its crossings." And he arranged its crossings, of No. 12 down ordinary train at Bailey Gate, and No. 14 and No. 17 down ordinary train at Templecombe. He heard further of the up-special-train up to and from Evercreech junction, and knew that the down-Bath-train had left the Bath ticket-platform at 10.48, and that the up-special-train had left Evercreech junction at 10 o'clock; but he neither asked for nor received any further news of these trains until 10.59. He states that he or his clerk were calling Wellow, to ascertain the position of the down-Bath-train, from 10.59 to 11.12 or 11.13, when he received the message previously referred to, "Down over T, up on from T." But inasmuch as the up-special-train was not sent forward from T (Foxcote) until 11.21, it must have been after 11.21 when Wellow sent that message. So that, in fact, Mr. Percy could not, apparently, have heard of either of these trains after their leaving, respectively, Bath and Evercreech, until about or after the time when the collision occurred. It was not, he says, until after he had received that message that he called Radstock, though he gives the time for it as about 11.5; and he was informed, in reply, that "the down-train was not in, and the up-train had left."

In excusing himself for not having arranged a crossing between these two trains, Mr. Percy further considered it the duty of Radstock to inform him of the approach to that station of the up-special-train, when notice of it was received from Midsomer Norton; and the duty of Wellow to inform him of the approach to that station of the Bath-down-train, when notice of it was received from Midford. And on this point arises one of the most serious questions in the whole case. According to the evidence of John, the telegraph-clerk at Radstock, he asked Glastonbury, at 10.30, "Which of the up-excursions is coming first?" and was told in reply, "The Burnham "excursion is first, the 7.10 from Wimborne is next, and the Burnham and Weymouth "excursion is last." He (John) says he attempted, at a time which he states at 10.55, but which would apparently have been later,—when he saw the gates open at the level-crossing, and the signal lowered for the up-special-train to run into Radstock station,—to ask Glastonbury, "Must we keep up-special here, as she has left Midsomer Norton?" But when he had got as far as "Must," he was stopped by O.A., which is used on this line as a terminal, and was an exceptional mode of refusing to receive a message. Mr. Percy, and his clerk, Locke, deny that such a message was attempted to be sent, or was so stopped, at or about that time; but Mr. Percy admitted, after hearing John's evidence, and after a portion of his own evidence subsequently given had been read to him, that such an occurrence took place at 10.39. Radstock tried then to say something, and was stopped by O.A. John, however, had made a memorandum at the time, in regard to the alleged attempt at 10.55; and had further written down a statement, not volunteered by himself, but accidentally discovered in his memorandum book during the inquiry, in which he explained that he had also replied O.A. to Glastonbury, when they subsequently tried to attract his attention, in return for their having stopped his message, which "was not pleasant." And it was then admitted that John had thus twice replied to a message from Glastonbury by O.A. A suggestion was made that O.A. might have been given by some other station on the circuit in stopping the alleged message from Radstock timed at 10.55, and the matter was so important that all witnesses were examined from the different stations who could throw any

light on the subject. The result was that the contradiction between Radstock and Glastonbury remained, directly affecting the credibility of the persons concerned at these stations; and it must be added that the Glastonbury telegraph-clerk, Locke, when pressed on the subject, wavered in his denial. The excuse of the Radstock station-master and telegraph-clerk for sending on the up-special-train without a crossing-order, rests partly on the basis of their having attempted to send this message, and of its having been refused, and partly on the ground of the crossing-agent having undertaken in the telegram at 7.40 to arrange the crossing-places of the up-special-train. The excuse of the crossing-agent for not having arranged its crossing by the down-Bath-special is, on the other hand, that he had not received the information which ought to have been furnished him from Radstock and Wellow, of the running of the trains, to enable him to do so. In considering all the evidence on this subject, and the way in which it was elicited, it is not possible to come to any other conclusion than that there was improper wrangling on the instruments between Glastonbury and Radstock, which was commenced by Glastonbury; that the crossing-agent not having expected the up-special-train to reach Radstock quite so soon, such wrangling was the cause of his not receiving the necessary information from Radstock, and of his not appointing a crossing-place for the two trains which so unfortunately came into collision; and that a most serious responsibility rests upon him for thus neglecting his duty.

Admitting, however, that two messages attempted to be sent from Radstock to Glastonbury were improperly checked from Glastonbury, and that the crossing-agent had previously assumed the responsibility, which he did not fully carry out, of arranging the crossings of the up-special train, the station-master at Radstock cannot be justified in sending forward the up-special-train at a time when the down-Bath-special was so long over-due in the opposite direction. Even though the strict letter of the printed regulations did not precisely refer to such a train running without a time-table notice, yet if he had observed common precautions he would have taken more pains to ascertain from Glastonbury whether it was right to send forward the up-relief-train under such circumstances.

It is quite clear that the precautions adopted with regard to ordinary trains, and with regard to special trains arranged to run according to printed time-tables, were neglected as regards the up-special-train. The crossing-agent did not receive, nor did he ask for, any information in regard to it, from the time when it left Evercreech at 10 o'clock until after the collision occurred. Although he had undertaken to arrange its crossings, he did not send crossing-orders to the station-masters, and the station-masters could not therefore give them to the engine-drivers. The printed Regulations required that "Drivers of trains sent on to cross other trains at places "where they are not marked to cross in the working time-book must be furnished "with a crossing-order." But Bishop, the engine-driver of the up-special-train, who "had never worked so before," running with a train for which no time-table had been arranged, and every crossing of which was out of course, crossed six trains between Wimborne and Radstock with only one crossing-message. It is difficult, under these circumstances, to blame him for leaving Radstock, as he had left other stations, without a crossing-order.

There are admittedly too many instruments on the circuit for one wire, which would prevent that free communication with Glastonbury which is prescribed by the Regulations, and which is so necessary; but the station-master at Radstock, who had received and issued crossing-orders for the two preceding trains, No. 16 ordinary and No. 16 up-special, to cross the down-Bath-train at Wellow, was certainly culpable for venturing, merely because two messages had been improperly checked, and because Glastonbury had telegraphed, "I will arrange the crossings," to allow the up-relief-train to leave Radstock for Wellow without any further instructions from Glastonbury and without a crossing-order.

Summary.

In considering the circumstances of this collision, the following defects of regulations and of working come to light:—

1. The Foxcote cabin was employed under regulations which did not contemplate or provide for such a cabin being interposed between two crossing-stations, and in a manner to constitute a breach of the undertaking given under seal of the Company to the Board of Trade, to the effect that only one engine in steam, or two or more engines coupled together, should be allowed to be between Radstock and Wellow at the same time.

2. The signalman in that cabin was comparatively inexperienced, was quite unable to use the speaking-instruments supplied in the cabin, and was almost unprovided with oil, so that he could not light the lamp of his distant-signal towards Wellow.

3. The responsibility for the safe working of the single-line was, in a great measure, and too often solely intrusted, at Wellow, to a boy 15 years of age, paid 7*s.* 6*d.* a week, and working ordinarily 14 hours a day, employed to book the passengers, collect the tickets, and attend to the accounts; and this boy had been on the 7th August in sole charge of the instruments from 6.30 p.m. to 11.15 p.m., while the station-master was absent, and thus on duty upwards of 15¼ hours when the collision occurred.

4. The system of signalling on the block-instruments prescribed in the regulations had been habitually neglected between Radstock and Midsomer-Norton, and had not been regularly attended to at Wellow and certain other stations.

5. The train-advice-book employed by the crossing-agent for arranging the crossing-places of the trains, and relied upon by him for that purpose, did not contain columns for entries from Radstock, or from some other stations.

6. When orders were given for running the up-relief-train, no time-table was drawn up for it by the superintendent; instructions were not, in the absence of any time-bill for it, forwarded to the different station-masters as to when they might expect it; and, although the crossing-agent had informed the various stations of the time named for it to start from Wimborne, and had arranged for its crossings at Bailey-Gate and Templecombe, he allowed it without any special notice to cross No. 18 down-train at Shepton-Mallet, and he did not take sufficient precautions to inform himself of its running, and thus to ascertain when it was likely to reach Radstock.

7. The crossing-agent checked in an improper manner messages which it was attempted to forward to him from Radstock, one at 10.39 p.m., and, if John is to be believed, a second at or after 10.55 p.m., the latter of which would have informed him of the approach of the up-special-train from Midsomer-Norton towards Radstock, and of the immediate necessity of arranging a crossing between that train and the down-Bath-train.

8. The up-relief-train was allowed to cross six trains at different stations, but the engine-driver had received only one instruction and no regular crossing-order.

9. The station-master and telegraph-clerk at Wellow, according to the evidence, in my opinion, allowed the down-Bath-train to leave Wellow without any notice to Foxcote, and without its being taken on block from Foxcote.

10. They received the usual signals, and accepted the up-special train from Foxcote, some five or six minutes later, and before the down-Bath-train had time to reach Foxcote; whereas they knew that the latter ought, when once started from Wellow, to have had time to reach Radstock before the former left Radstock.

11. The station-master at Radstock allowed the up-relief-train to leave that station for Foxcote without any crossing-order or instructions from the crossing-agent, placing too much reliance on the previous assurance from the crossing-agent that he would arrange the crossings, and not sufficiently persisting in the attempt, in which his telegraph clerk had twice been improperly stopped, to communicate with the crossing-agent.

12. The engine-drivers of these two trains, not knowing how other trains were running, and not having been accustomed strictly to obey the regulations as to crossing-orders or telegraph-passes, did not ask for either before leaving Wellow in the one direction or Radstock in the other.

13. There are, on the Bath circuit, too many telegraph-speaking-instruments on one line to admit of the regulations being properly carried out as to the free telegraphing of trains.

The relative responsibilities to be attached to the various officers and servants of the Company implicated in this accident, may, on the evidence be, in my opinion, apportioned as follows:—

Relative Responsibilities.

The Wellow station-master, Sleep, who, on his return from Midford, resumed his charge of the Wellow station, is directly responsible, first for having allowed the down-Bath-train to start from Wellow without the exchange of the necessary signals on the block-instruments with the Foxcote cabin; and secondly for having permitted the up-relief-train to leave Foxcote before the down-Bath-train (which could not cross it before reaching Radstock) had time even to reach Foxcote.

The Wellow telegraph-clerk, Hillard, was Sleep's agent in this proceeding, which was as certain a method as could have been devised of causing the two trains to meet each other in collision on the single line. It is only in consideration of his tender age —15; of his long hours,—upwards of 15, on duty; of his having other duties to perform incompatible with proper attention to his telegraph-instruments; and of the fact that Sleep was, under the regulations, in responsible charge of such arrange-*ments,—that he* can be considered free from the most serious consequences.

The crossing-agent, Percy, who had specially intimated to the various station-masters that he would arrange the crossings of the up-relief-train, also directly contributed to the collision, by failing to arrange a crossing-place for these two trains, knowing, as he did, that the up-relief-train had left Evercreech at 10 o'clock, and the down-Bath-train had left the ticket-platform at Bath at 10.48; by neglecting to ascertain how the up-relief-train was running after it left Evercreech at 10 o'clock; and by refusing to receive information proffered on the speaking-telegraph-instrument from Radstock in regard to it.

The Radstock station-master, Jarrett, was not, under the circumstances, with the down-Bath-train overdue at his station, justified in allowing the up-relief-train to leave Radstock for Foxcote and Wellow without a crossing-order, or more distinct instructions from Glastonbury. But it must be remembered that he had been informed from Glastonbury that the crossings of the up-relief-train would be arranged by the crossing-agent; that his telegraph-clerk had attempted to communicate with Glastonbury, and had been stopped in that attempt; and that the up-relief-train was duly taken on block from Foxcote.

The Superintendent of the line, Mr. Difford, who ordered the running of the up-relief-train, is responsible for not having caused a proper time-table to be made and telegraphed to the various stations, for so exceptional a train running on so busy a day all the way from Wimborne to Bath; and for the general want of uniformity between the regulations and the practice, the laxity of discipline, and the inefficiency and long hours of servants, disclosed during the inquiry.

When, on the one hand, the strongest comments are in such a case necessarily and unavoidably made in regard to the conduct of inferior officers and servants, justice demands, on the other hand, that the responsibilities which rest with those above them should not be omitted from consideration. Some excuse may properly be allowed for negligence or mistakes committed by inferior officers or servants, when they work continually under defects of regulations or discipline, or with inefficient or overworked colleagues, or under other disadvantageous conditions. But a corresponding degree of responsibility is, under such circumstances, necessarily transferred to their superiors. The Wellow station-master, Sleep, may be held, on the evidence, to have principally and directly contributed to this accident. But it is, at the same time, right to remember and record the precise circumstances under which he has fallen into this position. He complained of long hours. He was therefore permitted to leave duty at 6.30 p.m. daily. His duties after that hour devolved, according to the regulations, jointly on the telegraph-clerk and the signalman; but practically, as regards the responsibility of the single-line working with the telegraph-instruments, on the telegraph-clerk. On returning to the Wellow station at 11.8 p.m. he resumed his charge of the station, and his responsibilities. It has been urged that on such a day he ought not to have left his station at all; but if he had remained at his work he would have been on duty from 5.30 a.m. until some time after the accident, say for upwards of 18 hours. If, on the other hand, a responsible agent had been appointed, habitually, or even for that day only, to share his hours of duty, and take charge of the station when he was absent at his meals or after his regular hours, then he would not have committed this fatal mistake. And the superintendent, Mr. Difford, and the inspector, Wood, who failed to make proper arrangements at this station for the better working of the line and for securing the safety of the public, must be held, so far, to share with Sleep the responsibility of the collision. As the directors of the Somerset and Dorset Railway Company had legally surrendered their position in regard to the working of their line; as the Midland and London-and-South-Western Railway Companies had so recently acquired joint possession of it; and as no change had taken place in the local management,—there is greater difficulty than there might otherwise have been in such a case in fixing the responsibility higher than the superintendent.

Single-line working.

The dangers peculiar to single-line working are precisely those connected with alterations in the crossing-places of trains. As long as trains are running in accordance with properly arranged time-tables there is no risk of their meeting one another in collision. When it becomes necessary, in consequence of unpunctuality, or of extra trains being started, to alter crossing-places, or to provide for fresh crossings, then the dangers commence against which it is the object of regulations efficiently to provide. On some lines of railway, these alterations are left to the station-masters, subject to block-telegraph-working, to arrange between them. On other lines crossing-agents are employed with the special duty of constantly watching the running of the trains, and with the double object of avoiding delay, and of contributing to safety. On other lines, again, the train-staff-system is employed, and no engine or train is permitted to start from a station unless the train-staff applying to the section on which it is

to travel is present at the station. It has long been observed that the block-telegraph system, so valuable on double lines of railway, to prevent following engines or trains from overtaking and coming into collision with one another, is not equally to be relied upon in single-line working to prevent collisions between meeting trains; and the experience obtained from time to time in this respect has led to the introduction and employment of the train-staff. So far as experience shows, up to the present time, the combination of block-telegraph and train-staff working appears to offer the highest degree of safety, having regard to the practice of this country, though it must be admitted that the train-staff is apt to cause trouble and occasion delay, more especially on long lengths of single line. Various improvements are further from time to time proposed and discussed, such as electrical interlocking, combined action of signal-levers and telegraph-instruments, and automatic arrangements; and some of these may hereafter be found to work satisfactorily. But, whatever the system of working, or the apparatus employed, safety must more or less depend upon strict adherence to simple rules, and on the employment of responsible agents, carefully selected and closely watched. Strict discipline with an inferior system will, as I have frequently had occasion to observe, generally afford better results than a superior system without good discipline. The risk of working must be materially increased when, as in the present instance, the regulations do not apply to the mode or the appliances of working; when the rules as regards the mode of telegraphing trains, or the use of crossing-orders or telegraph-passes, are not faithfully carried out; when there are too many telegraph-instruments on one wire; when signal-lamps cannot be lighted for want of oil; when special trains are run without printed notices, or even proper telegraphic advices; when wrangling takes place, and important messages are improperly checked from head-quarters on the telegraph-instruments; and when the duties supposed to be performed by responsible station-masters are allowed, in practice, to devolve upon telegraph-clerks of immature age or experience, employed for long hours, and taken away constantly to duties incompatible with their proper attention to the simple details prescribed with a view to safety. Railway traffic worked under such conditions cannot, whatever the system employed, expected to be carried on without serious accidents. It is by the avoidance of these defects in the first instance, rather than by seeking for any improvements in systems of working, that safety must be sought in the working of single lines of railway.

I have, &c.,
H. W. Tyler.

The Secretary,
(*Railway Department,*)
Board of Trade.

I concur in the above report.
W. W. Ravenhill.

APPENDIX.

APPENDIX A.

Copy of Undertaking given by the Somerset and Dorset Company, in regard to the mode of working the Bath Extension.

Somerset and Dorset Railway Company.

Glastonbury,
15th July 1874.

We, the Somerset and Dorset Railway Company, hereby undertake to work the "Extension to the Midland Railway at Bath," in such manner that only one engine in steam, or two or more engines coupled together, shall be upon the portions of the line under-mentioned, at one and the same time, viz.:

Evercreech junction and Evercreech Village.
Evercreech Village and Shepton Mallet.
Shepton Mallet and Binegar.
Binegar and Midsomer Norton.
Midsomer Norton and Radstock.
Radstock and Wellow.
Wellow and Bath.

The line will also be worked upon the absolute block system of telegraph.

I certify that this is the corporate seal of the Somerset and Dorset Railway Company.

(Signed) A. Difford,
Secretary.

15th July 1874.

Seal of the Company.

APPENDIX B.

Somerset and Dorset Railway.

Signal instructions, No. 17·5.

Opening of the Braysdown and Foxcote Colliery Sidings.

Instructions as to Signals, to come into operation on Wednesday, 26th May 1875, at 6.0 a.m.

These sidings are situate about one mile north of Radstock, with facing points for down trains.

They are protected by the usual semaphore auxiliary signals in each direction, and also by two home signals, (one on each side of the signal cabin,) all interlocked with the points. Each home signal has two arms—the upper for through trains, the lower for goods and mineral trains, stopping at the sidings.

All trains must approach these sidings with caution.

The signal cabin will be a telegraph block station intermediate between Radstock and Wellow, and will be open during train hours. It will also be supplied with a speaking instrument on the through Bath circuit (call T.)

Secretary's Office, Glastonbury,
24th May 1875.

A. Difford.

APPENDIX C.

Private.

SOMERSET AND DORSET RAILWAY,

Special Notice, No. 17/76.

Station Agents are required personally to distribute this notice to their staff, and every person supplied with a copy is held responsible to read it carefully through to note the general information it contains, and act up to and obey the instructions particularly applicable to himself. No excuse of want of knowledge of these special arrangements can be admitted for any failure or neglect of duty.

SPECIAL TRAINS and EXCURSION ARRANGEMENTS for week ending 12th August 1876.

Picnic and Pleasure Parties.—*Bill No.* 23.

No. 1.—The return fares are a single fare and a quarter, plus fractions of a penny.

BATH REGATTA, 7th August 1876.

Excursions to Bath on Monday—*Bill No.* 47,
and
Market tickets to Bath every Saturday—*Bill No.* 25.

On Monday and Saturday Special Service in connection will run as follows:—

No. 2.	DOWN.	A.M.	
Dep.	Wells	9 0	
„	Polsham	9 6	
Arr.	Glastonbury	9 15	cross No. 5 down ordinary.
Dep.	„	9 20	
„	West Pennard	9 35	
„	Pylle	9 45	
Arr.	Evercreech Junction	9 52*	

* Attach to No. 5 up ordinary.

No. 3.	UP.	A.M.	
Dep.	Evercreech Junction	8 45	engine light. After No. 2 down arr.
„	Pylle	8 50	
„	West Pennard	8 58	
Arr.	Glastonbury	9 10	
Dep.	„	9 23	Wells engine light.
Pass	Polsham	9 30	
Arr.	Wells	9 35	

The 7.25 a.m. up ordinary train from Bournemouth must be strengthened on Bank Holiday, and *a large engine to be upon this train.*

Coaches to return by No. 17 down from Bath, and attach to No. 11 up train at Evercreech Junction for Wells.

On Monday, 7th August,

Bath Young Men's Liberal Association, Bath to Midford and back (about 500), Fare 6*d.* each.

DOWN.	4		UP.	5	
	P.M. ARR.	P.M. DEP.		P.M. ARR.	P.M. DEP.	
Bath { Mid. Station	—	2 0	Radstock	—	9 55	*Engine of No.* 7 *down special.*
Bath { T. Platform	2 5			*After No.* 18 *down arr., and ahead of No.* 16 *up ordinary.*		
Midford	2 15	2 20	Wellow		10 3	
Wellow	2 30	2 36	Midford	10 8	10 15	
	Cross No. 9 up ordinary.		Bath { T. Platform	10 24	10 30	
Radstock	2 45	—	Bath { Mid. Station	10 35	—	

Midford tickets to be issued at Bath to members of this party on production of a Picnic Card, of which the following is a copy:—

> Bath Young Men's Liberal Association.
>
> ANNUAL PICNIC.
>
> Midford, August 7th, 1876.
>
> This part of Ticket to be given up for Railway Ticket at Midland Station.

Mr. Maber, the Secretary to the Association, will on the following morning pay the total amount of such tickets issued.

Bath Regatta.—*Bill No.* 46.—Special Trains will run as follows:

UP.	6			DOWN.	7	
	P.M. ARR.	P.M. DEP.			P.M. ARR.	P.M. DEP.
Radstock	—	3 0	*Engine of No.* 4 *down special.*	Bath { Mid. Station	—	9 15
Wellow	—	3 10		Bath { T. Platform	—	—
Midford	—	3 17		Midford	—	9 28
Bath { T. Platform	3 26	3 30		Wellow	—	9 35
Bath { Mid. Station	3 35	—			Cross No. 18 up ordinary.	
				Radstock	9 45	—
					No. 16 up to be kept to cross.	

MONDAY—*continued.*

Excursions to Poole ndd Bournemouth every Monday and Thursday.
Reduced Fares.—*Bill No.* 29.

Special Service between Templecombe and Wincanton, in connection, will run as follows, on Mondays only:

Down.		No. 8 A.M.	No. 9 P.M.
Dep.	Wincanton - -	7 45	11 9
Arr.	Templecombe - -	7 52*	11 15

* Attach to No. 1 down ordinary.

Up.		No. 10. A.M.	No. 11. P.M.
Dep.	Templecombe -	7 30	10 57 after No. 18 down ordinary.
Arr.	Wincanton -	7 38	11 5

No. 19 up ordinary will have coaches attached, and stop where necessary to set down passengers. *The load to be arranged by Inspector Carter.*

SPECIAL EXCURSION—Bristol, Bath, &c., to Bournemouth and Weymouth, &c. *Bill No.* 41.

Down.	12. A.M. ARR.	12. A.M. DEP.	
Bristol (St. Phillips) - -		6 45	*Midland Engine.*
Fishponds - - -	—	6 53	
Mangotsfield - - -	—	7 0	
Warmley - - -	—	7 5	
Bitton - - -	—	7 12	
Bath - - -	7 20	—	
Bath - - - -		7 30 after No. 1 up arr.	
Midford - - -		7 43	
Wellow - - -		7 50 pass No. 4 down.	
Radstock - - -	8 0	8 4 after No. 2 up ody.	
Midsomer Norton - -		8 10	
Chilcompton - -		8 16	
Binegar - - -		8 23	
Masbury Summit - -		8 27	
Shepton Mallet - -	8 36	8 40	
Evercreech - - -		8 49	
Evercreech Junction - -		8 55	
Cole - - -	—	9 5	
Wincanton - - -		9 15	
Horsington - -	9 21	9 23 for water.	
Templecombe Lower - -		9 24 after No. 5 up and ahead of No. 3 dn ody.	
Hentsridge - - -		9 29	
Stalbridge - - -		9 33	
Sturminster - -		9 41	
Shillingstone - - -		9 47	
Blandford - - -		9 58	
Spetisbury - - -		10 3	
Bailey Gate - -		10 8	
Wimborne (for Weymouth)	10 20	11 18	
Weymouth - - -	12 33	—	
Wimborne (for Bournemouth)	10 20	10 27	
Poole Junction - -	—	10 35 cross No. 5 up S.W.	
Poole Town - - -	—	10 45	
Parkstone - - -	10	10 52	
Bournemouth - - -	11 0		

Up.	13. P.M. ARR.	13. P.M. DEP.	
Bournemouth - -		7 10 after No. 12 dn. S.W. train.	
Parkstone - - -	7	7 15	
Poole Town - - -	—	7 22 cross No. 13 down S.W. train.	
Poole Junction -		7 32	
Wimborne -	7 38	7 42 aftr. No. 12 dn. ody.	
Weymouth		6 30	
Wimborne - -	7 40	—	
Bailey Gate - -		7 54 *thro' dn. line.*	
Spetisbury - - -		8 0	
Blandford - - -		8 6 *thro' dn. line.*	
Shillingstone - - -		8 18	
Sturminster - - -	8 26	8 30 *cross No. 16 dn. ordy., and water.*	
Stalbridge - - -	8 40	8 41 cross No. 17 dn. ordy.	
Henstridge - - -		8 46	
Templecombe Lower - -	8 51	8 57 *after No. 17 dn. ordy. arr.*	
Wincanton - - -		9 5 *examine tickets*	
Cole - - - -	—	9 15	
Evercreech Junction -	9 22	9 23	
Evercreech, New - -		9 28	
Shepton Mallet - -	9 40	9 45 No. 18 dn. ordy. to be kept to cross.	
Masbury - - -		9 55	
Binegar - - -		10 0	
Chilcompton - -		10 7	
Midsomer Norton - -		10 14	
Radstock - - -	10 20	10 22	
Wellow - - -		10 32	
Midford - - -		10 38	
Bath Ticket Plat. -	10 46	10 53	
Bath Mid. Station -	11 0	—	
Bath - - -	—	11 5	*Midland Engine.*
Bitton - - -	—	11 13	
Warmley - - -	—	11 20	
Mangotsfield - - -	—	11 25	
Fishponds - - -	—	11 32	
Bristol (St. Phillips) -	11 40	—	

Foresters' Fete at Sherborne.

No. 14.—1st, 2nd, and 3rd class return tickets, at single-journey fares, will be issued from all stations to Sherborne, by the 7 25 a.m. from Bournemouth, 7.15 a.m. from Bath, and 7.20 a.m. from Burnham, (which trains must be strengthened,) available to return by ordinary trains same day.

MONDAY—*continued.*

EXCURSION to BURNHAM.—Special Trains will run as follows. *Bill No.*

DOWN.	No. 15. A.M. ARR.	DEP.	DOWN.	No. 16. P.M. ARR.	DEP.
Bath Midland Station		9 0	Burnham		8 0
	aft. No. 2 up ody.		Highbridge	8 7	8 10
				aft. No. 9 up arr.	
Bath Ticket Platform	—	—			
Midford		9 13		*examine tickets.*	
Wellow		9 20	Bason Bridge	—	8 17
Radstock	9 30	9 33	Edington	—	8 27
	aft. No. 4 up arr. pass No. 6 dn. ody.		Shapwick	—	8 35
			Ashcott	—	8 42
Midsomer Norton	—	9 41	Glastonbury	8 50	9 0
Chilcompton	—	9 50			
Binegar	—	9 59	West Pennard	9 15	9 17
Masbury	—	10 4		*cross No. 10 & 11 up ordinary.*	
Shepton Mallet	10 13	10 15			
	crs. No. 5 up ody.		Pylle	—	9 30
Evercreech, New	—	10 25	Evercreech Junc.	9 35	
Evercreech Junc.	10 30	—			

UP.	A.M. ARR.	DEP.	UP.	P.M. ARR.	DEP.
Evercreech Junc.		10 35	Evercreech Junc.		9 40
Pylle	—	10 43		*not to start till No. 13 up spcl. has signalled into Shepton.*	
West Pennard	—	10 52			
	crs. No. 3 dn. ody.		Evercreech Village	—	9 47
Glastonbury	11 5	11 10	Shepton Mallet	10 0	10 5
	examine tickets.			*No. 18 dn. ody. to be kept to cross.*	
Ashcott	—	11 17			
Shapwick	—	11 22	Masbury	—	10 17
Edington	—	11 30	Binegar	—	10 24
Bason Bridge	11	35	Chilcompton	—	10 33
Highbridge	11	40	Midsomer Norton	—	10 41
Burnham	11 45	—	Radstock	10 48	10 50
	crs. No. 4 dn. ody.		Wellow	—	11 3
			Midford	—	11 10
			Bath { Ticket P.	11 22	10 25
			Bath { Mid. Station	11 30	

HIGHBRIDGE MARKET.—A Special Cattle Train will run as follows:—

No. 17.	P.M. ARR.	DEP.
Highbridge	—	12 20 *follow No. 4 down and ahead of No. 5 down ody.*
Bason Bridge	—	—
Edington	—	—
Shapwick	12	38
Ashcott	—	—
Glastonbury	12 52	1 20 *cross No. 5 up ordinary.*
West Pennard	1 35	1 40
Pylle	1	50
Evercreech Junction	1 58	2 5 *after No. 9 up Main Line.*
Cole	2	20
Wincanton	2 32	2 40 *cross No. 10 up ordinary.*
Templecombe (Upper)	2 50	— *cross No. 11 up ordinary.*

[illegible] coupled to No. 12 up ordinary train for Highbridge.

MONDAY—*continued.*

SPECIAL EXCURSION—Burnham, &c., to Glastonbury and Wells.

No. 18. DOWN.

P.M.	ARR.	DEP.	
Burnham	—	12 40	*Engine and Carriages of No. 15 up special.*
Highbridge Station	12 47	12 50	
Bason Bridge	..	12 55	
Edington		1 5	
Shapwick		1 13	*cross No. 5 up ordinary.*
Ashcott		—	
Glastonbury	1 26	1 30	
Polsham		—	
Wells	1 45		

These tickets to be available to return from Wells per 6.30 p.m. up ordinary train, and from Glastonbury per 6.50 p.m. and 9 8 p.m. same day.

SPECIAL EXCURSION—Wells and Glastonbury to Burnham.

No. 19. UP.

P.M.	ARR.	DEP.	
Wells		2 15	*Engine and train of No. 18 down special.*
Polsham		2 20	
Glastonbury	2 30	2 35	
Ashcott	2	41	
Shapwick		2 46	
Edington	2	51	
Bason Bridge	2	59	
Highbridge Station	3 3	3 5	
Burnham	3 12	—	

These tickets to be available to return per 8.10 p.m. ordinary train from Burnham same day.

* * * *

(Signed) A. DIFFORD, Superintendent.

Office of Superintendent of Line, Glastonbury, 3rd August 1876.

APPENDIX D.

REGULATIONS for working TRAINS by the ABSOLUTE BLOCK TELEGRAPH SYSTEM.

[illegible]

The "Block" or signal instruments are to be devoted exclusively to signalling of trains, and the authority to work them is confined solely to the station agent, without whose authority no signal whatever is to be passed.

[illegible]

of it by giving four steady beats of the needle to the [illegible] which Station A. will acknowledge to Station B. in the same manner; but the peg must not be removed until Station B. has ascertained from the guard that the whole of his train has arrived, and has also seen the [illegible] Target signal by day, or the corresponding red tail lamp by night, on the incoming train.

2. If, when the signal is given from Station A. "Is line clear?" the line should not be clear, the reply "Blocked" is to be immediately returned by Station B. giving six distinct beats to the left, which signal [illegible] Station B. will repeat.

[illegible]

special trains, ballast trains, trucks, or other obstructions; he must also be sure that no train has been divided and only part of it brought into his station, as may sometimes happen with heavy goods trains (see memorandum on Rules 1 and 7), and that the points are in their proper position.

8. Should the block telegraph be out of order, recourse must be had to the single needle telegraph, and the following rules strictly observed:—

When a train is ready to leave Station A. the question is to be asked of Station B., "Is line clear?" Station B. will reply (as the case may be) with "Yes, line clear," or "No, blocked," and the question and answer must be entered in the line clear book at both stations. If the answer has been received at Station A. that the line is blocked, the train must not be started from that station until another message is received from Station B. that "Line is clear." Station A. must then send message to Station B. "Train will start," and Station B. must reply to Station A. as soon as it is ascertained that the whole of the train has arrived, "Train arrived."

9. Every message affecting the working of the line, such as crossing of trains, &c., obstruction signals, is to be copied into the "Line clear message book," before it is despatched, and the receiving station must repeat it to the forwarding station as a proof of its receipt and correct transmission, and the time of such repetition is to be entered at the foot of both the forwarded and received form in the space provided for that purpose. Such messages and repeats are to bear the special prefix "S R" (repeated message), which will entitle them to take precedence of all others except "D. G's." Station agents are in all cases to see these messages transmitted, and must examine the repetition with original to prove its correct transmission.

Working Trains when both Telegraphs are out of order.

10. Should both telegraphs be out of order, no train shall be permitted to pass the crossing places fixed by the working time book until the train it is appointed to meet shall arrive at such crossing place, or unless and until a message in writing, signed by the station agent, shall have been forwarded by special messenger from Station A. to Station B. to ascertain that the line is clear, and a written answer has been received by Station A. from Station B. that the line is clear, that it will be kept clear, and that the train may proceed.

11. Should both telegraphs be out of order, the drivers of trains be instructed to proceed with great caution.

Regulations for altering the Crossing Places of Trains shown in the Working Time Book.

12. The crossing places as shown in the working time books must never be changed, except by the direction of the Superintendent at Glastonbury, and then only in case of ascertained delay to the trains, or of accident or breakdown; and not until the telegram sent by the Superintendent at Glastonbury, altering the crossing arrangements has been correctly repeated from the stations with which the arrangements are made, and in no case is a train to be sent forward until the whole instructions in Rule No. 1 have been fully complied with.

13. When a train is ordered to proceed beyond the ordinary crossing place a red flag by day, and a red lamp by night, will be fastened to the buffer plank of the engine by the driver. All signalmen, pointsmen, and others will in such cases allow the train to proceed, this signal indicating that they have had special instructions to do so.

14. Drivers of trains sent on to cross other trains at places where they are not marked to cross in the working time book must be furnished with a crossing order, directing them to do so, and stating where the traius are to cross; this order must be signed by the station agent issuing the same. Then after the special instructions contained in the crossing order have been obeyed, the trains are to meet and pass each other at the regular crossing places marked in the working time book.

Special Notice.

The red or danger signal is to be shown at all block telegraph stations, until the line is telegraphed clear, and any engine or train arriving within this period is to be stopped, and the driver and guard told by the station agent that the line is blocked, according to the indication of the needle.

The guards before starting from a block telegraph station must ascertain from the station agent that the line is clear to the next station, and immediately on arriving at a station they must inform the agent whether their whole train has arrived or not. In the case of trains that pass stations without stopping the guards must give the all-right white flag signal by day and show a white light by night.

Memorandum on Rules I. & VII.

On the arrival of either a goods, ballast, or passenger train at a station, the guard will report to the station agent that the whole of his train has arrived, always stating No. of train, and whether "up" or "down," and the agent must not signal its arrival to the last station it had left until he has received this report from the guard, and also seen the white target signal by day or the red tail lamp signal by night on the incoming train.

(*a.*) During the night, or in the absence of the station agent, the station signalman or pointsman will act jointly with the telegraph clerk in the place of the station agent.

(*b.*) When trains pass a station at which they are not timed to stop, the guard must look out and signal that all is right, by holding out a white flag by day, and by holding out a white light by night.

(*c.*) Upon no consideration, and under penalty of instant dismissal, must a telegraph clerk signal "Line clear" until he has been so instructed by the station agent or his deputy to do so.

All special engines, or special trains, with passengers, goods, mineral or ballast engines, or trains not inserted in the regular working time book for the current month, must be furnished, before leaving any block station, with a telegraph pass, carefully filled up with the number and time of the train, signed by the station agent issuing the same, showing that the line is clear to the next block station in advance.

In no case must a ballast engine, on leaving a block station, return to that station without having been to the block station in advance, and having received a line clear ticket to enable it to return.

The station agent must each morning carefully examine the line clear book entries of the previous day, and attach his signature at the foot thereof, in proof of such examination. Should he discover any omission, careless or incorrect entry, a full report of the same must at once be sent to the Secretary. Duplicate copies of the "line clear book" will be supplied to each station, one copy to be sent on the first of each month to the Secretary's office for examination, while the other copy is in use.

Section IV.

Station Agents.

Every officer in charge of a station is responsible for the faithful and efficient discharge of the duties devolving upon all the Company's servants at the station.

He shall be answerable for the state of the office and buildings, and the Company's property there; he shall daily inspect all rooms and places in connection with the station, particularly the urinals and closets, in order to see that they are neat and clean; and he shall cause the station to be kept clear of weeds, and the ballast raked and preserved in neat order. He shall also preserve the toll and notice boards, and the byelaws for regulating the traffic of the railway, and shall see to their proper exhibition at the station. He will make public such notices as are issued to the public by the Company, but exhibit no other notices without special permission.

Rules of Electric Telegraph Department.

Train Advices (T.A.).

30. Station agents are instructed to advise Glastonbury by telegram (T.A. prefix) of the position of *all* trains timed to cross at their respective stations; for example, Nos. 10 up and 10 down-trains are timed to cross at Pylle: *immediately* line clear is asked to Pylle for the first of these two trains (whichever it may happen to be) it will be the duty of the agent there to advise Glastonbury, and to add "Pennard (or, as the case may be,) Evercreech has not yet asked line clear for No. —," the other of the two trains. A record of these advices will be kept at Glastonbury, in a register for the purpose.

Departures of all down-trains must also be signalled from Bath (Mid-station) to Glastonbury, from Shepton to Evercreech Old and to Glastonbury, from Highbridge to Glastonbury, from Cole to Templecombe (No. 2 box), and from Blandford to Wimborne. Departure of all up-trains must be signalled from Wimborne to Blandford and Glastonbury, from Stalbridge to No. 2 box Templecombe, from No. 2 box Templecombe to Evercreech Old and Glastonbury, from Evercreech Old to Glastonbury, and from Radstock and ticket platform to Bath.

General information as to the position of *all* trains must also be *freely* telegraphed to Glastonbury by all stations in order to prevent delays in crossing.

APPENDIX E.

CHANGE OF CROSSING PLACE.—FORMS EMPLOYED.

SOMERSET AND DORSET RAILWAY.

TELEGRAPHIC DESPATCH.

ORDER TO KEEP TRAIN.

Glastonbury Station.

Prefix, S. R. Code Time, K.C. No. of Words, 20. Delivered to Clerk, 10.15 p.m. Date, August 7th, 1876. Received 10.15 p.m. } Sent to W. Station by me J.L., Sent, 10.19 p.m. } clerk.

From Percy, Glastonbury Station, to Sleep, Wellow Station.

Keep No. seven down special train at Wellow to cross No. sixteen up ordinary train. Repeat.

Repeated at 10.20 p.m.

(Signature) C. E. PERCY.

SOMERSET AND DORSET RAILWAY.

TELEGRAPHIC DESPATCH.

ORDER TO SEND ON TRAIN.

Glastonbury Station.

Prefix, S. R. Code time, K.C. No. of Words, 21. Delivered to Clerk, 10.15 p.m. Date August 7th, 1876. Received, 10.15 p.m. } Sent to D.K. Station, by me, J.L., Sent, 10.22 p.m. } clerk.

From Percy, Glastonbury Station, to Jarrett, Radstock Station.

Send on No. sixteen up ordinary train to cross No. seven down special train at Wellow. Repeat.

Repeated at 10.23 p.m.

(Signature) C. E. PERCY.

SOMERSET AND DORSET RAILWAY.

TELEGRAPHIC DESPATCH.

ORDER TO KEEP TRAIN.

Glastonbury Station.

Prefix, S. R. Code Time, K. F. No. of Words, 20. Delivered to Clerk, 10.30 p.m. Date, August 7th, 1876. Received, 10.30 p.m. } Sent to W. Station, by me, J.L., Sent, 10.35 p.m. } clerk.

From Percy, Glastonbury Station, to Sleep, Wellow Station.

Keep No. seven down special train at Wellow to cross No. sixteen up special train. Repeat.

Repeated at 10.36 p.m.

(Signature) C. E. PERCY.

SOMERSET AND DORSET RAILWAY.

TELEGRAPHIC DESPATCH.

ORDER TO SEND ON TRAIN.

Glastonbury Station.

Prefix, S. R. Code Time, K. F. No. of Words, 21. Delivered to Clerk, 10.30 p.m. Date, August 7th, 1876, Received, 10.30 p.m. } Sent to D.K. Station by me, J.L., Sent, 10.38 p.m. } clerk.

From Percy, Glastonbury Station, to Jarrett, Radstock station.

Send on No. sixteen up special train to cross No. seven down special train at Wellow. Repeat.

Repeated at 10.39 p.m.

(Signature) C. E. PERCY.

SOMERSET AND DORSET RAILWAY.

TELEGRAPHIC DESPATCH.

ORDER TO KEEP TRAIN.

Glastonbury Station.

Prefix, S. R. Code Time, K. L. No. of Words, 18. Delivered to Clerk, 10.55 p.m. Date, August 7th, 1876. Received, 10.55 p.m. } Sent to W.G. Station by me, J.L., Sent, 10.57 p.m. } clerk.

From Percy, Glastonbury Station, to Haifman, Wincanton Station.

Keep No. eighteen down train at Wincanton to cross No. nineteen up train. Repeat.

Repeated at 10.58 p.m.

(Signature) C. E. PERCY.

SOMERSET AND DORSET RAILWAY.

TELEGRAPHIC DESPATCH.

ORDER TO SEND ON TRAIN.

Glastonbury Station.

Prefix, S. R. Code Time, K. L. No. of Words, 19. Delivered to Clerk, 10.55 p.m. Date, August 7th, 1876. Received, 10.55 p.m. } Sent to T.O. Station by me, J.L., Sent, 10.59 p.m. } clerk.

From Percy, Glastonbury Station, to Thomas, Templecombe Station.

Send on No. nineteen up train to cross No. eighteen down train at Wincanton. Repeat.

Repeated at 11.0 p.m.

(Signature) C. E. PERCY.

SOMERSET AND DORSET RAILWAY.

Prefix, S. R. Code Time, K. F. No. of Words, 20.

Station from which the Message is received.	Receipt. Fin.	Receiving Clerk's Signature.	Station to which the Message is transmitted.	Time transmitted. Fin.	Transmitting Clerk's Signature, or Messenger's Name.
G. Y.	h. m. 10.40 —m	A. H.		h. m. " —m	

Wellow Station, August 7th, 1876.

From Percy, Glastonbury Station, to Sleep, Wellow Station.

Keep No. seven down special train at Wellow to cross No. sixteen up special train. Repeat.

Received at 10.40 p.m.

(Signature) JAMES SLEEP.

Receivers of Telegrams are requested to carefully fill in the spaces for time of delivery and signature.

SOMERSET AND DORSET RAILWAY.

Prefix, S. R. Code Time, K. F. No. of Words, 21.

Station from which the Message is received.	Receipt. Fin.	Receiving Clerk's Signature.	Station to which the Message is transmitted.	Time transmitted. Fin.	Transmitting Clerk's Signature, or Messenger's Name.
G. Y.	h. m. 10.37 —m	W. H. J.		h. m. " —m	

Radstock Station, August 7th, 1876.

From Percy, Glastonbury Station, to Jarrett, Radstock Station.

Send on No. sixteen up special train to cross No. seven down special train at Wellow. Repeat.

Received at

(Signature) J. V. JARRETT.

Receivers of Telegrams are requested to carefully fill in the spaces for time of delivery and signature.

APPENDIX F.

COST OF THE DAMAGE DONE TO ROLLING STOCK BY THE COLLISION NEAR RADSTOCK.

Estimated cost of repairs to engines and coaches injured in the collision at Braysdown :—

	£	s.
No. 5 engine - - -	197	0
No. 7 „ - - - -	58	0
Five S. & D. coaches and one break-van	189	0
Extent of injury to 11 Midland vehicles	1,416	15

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